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DISLOCATIONS*

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Mr. President, Ladies and Gentlemen:

THE subject of my lecture to-night is one which, in an historical sense, is well-known to this Society. Many important and original contributions on it have been made by its members. Of these contributors perhaps the most distinguished was Henry Jacob Bigelow who was almost a contemporary of the founder of this Lectureship. His treatise on "The Dislocations of the Hip" is a classic to which the student of surgical pathology still turns when he wishes to acquire basic knowledge of the subject. Perhaps the shade of George Cheyne Shattuck, the elder, will pardon the introduction of this subject to-night when he recalls that the study of it brought so much distinction to a surgeon of his own time.

The phase of the subject that has interested me chiefly has been the pathology and treatment of those dislocations that have shown a tendency to recur or to persist in spite of apparently successful reduction. The number of such cases is surprisingly large and is sufficiently impressive to increase greatly one's idea of the importance of dislocation as a cause of permanent disablement.

The dislocation with which all are familiar is the ordinary traumatic dislocation in which the articular surfaces are forcibly separated from one another after the rupture or stretching of the ligaments or tendons which ordinarily hold the bones in apposition. This injury to the ligaments may occur as a transverse tear, or as a split between the fibres, or more often as an avulsion of the ligaments from the bones on one or the other side of the joint.

It is not often that one has an opportunity to make a postmortem examination of a dislocation but I have had many opportunities to observe the morbid anatomy at operation and have been struck with the frequency with which dislocations, particularly subcoracoid dislocations of the shoulder, have been accompanied by avulsion of the ligaments from the bone. I am impressed that in dislocation of the shoulder this avulsion of the capsule from the anterior and lower part of the rim of the glenoid is the chief cause of recurrences. These recurrences are due to the incompleteness with which the avulsed capsule heals down to the bone, either as the result of too early movement of the limb or of failure of the ligaments to return to their normal position. As a result the capsule is much weakened and lengthened so that it no longer is able to prevent forward and downward movement of the head.

The tendency to recurrence of dislocation depends decidedly on the shape of the bones forming the joint. Thus, the hip joint rarely shows a tendency to recurring dislocation because its strength depends on the ball-and-socket arrangement of the bones and not on the strength of ligaments. In the case of the shoulder the reverse is the case as the shape of the bones is only moderately helpful in preventing dislocation and the strength of ligaments and tendons is very important. In a third type of joint, such as the acromioclavicular and the sternoclavicular, the shape of the bones is of so little importance that the natural tendency of the joint is toward dislocation and this is prevented only by the ligaments. If these are torn or avulsed, the usual result is a permanent dislocation.

The study of a large number of dislocations has impressed on me the importance of congenital abnormalities of the bones and ligaments as a cause of dislocation. I have lately seen three cases of dislocation of the shoulder in which displacement occurred without any traumatism whatever. One occurred when the patient made an unusually powerful stroke while swimming, another during an ordinary dive off a six foot dock and the third when reaching suddenly for something above his head. The x-rays showed the glenoid unusually small and the anterior lower lip very low. Examined under anesthesia the head of the humerus could be pushed in and out of the glenoid with a finger tip.

The same observation may be made in regard to recurring dislocation of the patella. In some

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cases, of course, a poorly repaired laceration of the capsule is the sole cause of the bad result but in most of the cases the trouble has no relation to traumatism but is a symmetrical disturbance, occurring in adolescent girls, due to extraordinary laxity of the capsule and absence of a proper outer lip of the patellar groove of the femur. Repetition of the dislocation naturally makes matters worse, but the real cause is the original anatomical abnormality. Even in dislocations in which violent traumatism is the undoubted cause of the first dislocation, there is plenty of evidence that the subsequent tendency to recurrence is often the result of some old anatomical defect such as a low anterior lip on the glenoid.

In an age when operations have become so important in the treatment of fractures it is surprising that they have not become more popular in the treatment of dislocations. The explanation is that the results of conservative treatment are, on the whole, satisfactory. I feel sure, however, that a good many bad results could be prevented if severe ruptures of ligaments were inspected early through an appropriate incision and measures taken to repair the damage accurately. Nobody thinks of leaving a wound of the skin wide open or neglects to bring together the separated fragments of a patella or olecranon, yet how seldom does one hear of a similar operation for the immediate repair of a crucial ligament in the knee or a trapezoid or costoclavicular ligament in the dislocations of the clavicle. Immediate operation has been established as the best treatment for ruptures of the quadriceps and the ligamentum patellae, the ruptures and avulsions of the tendon of the supraspinatus and the capsule of the shoulder, so why not also in those other joint injuries that lead in so many instances to permanent or recurring dislocations.

The time-honoured treatment of dislocations has consisted of the reduction of the displacement and the placing of the limb in such a position that the injured ligament may heal and be restored to normal as quickly as possible. Only those movements are allowed that do not stretch the healing scar. This plan has undoubtedly resulted in satisfactory recovery in the vast majority of these injuries and one must admit at once that the need for any modification of the plan is evident only in the small minority of dislocations that do not respond to the treatment and are left with serious disability. These, unfortunately, are not rare and constitute a considerable problem both in civil and industrial surgery.

A typical example is seen in severe dislocations of the acromioclavicular joint. In the mild injuries the damage to ligaments is limited to the capsule and the amount of displacement is slight, so that, in spite of the fact that the treatment is usually quite futile and the slight amount of displacement almost invariably persists, the function is not disturbed. In the severe dislocations, however, where the coracoclavicular ligaments are ruptured, the clavicle rides up over the acromion and stays there and the result is a deformed and painful and permanently disabled shoulder. It is perfectly simple to reduce the dislocation by manipulation and it may be possible to hold the articular surfaces in fair approximation by apparatus; but the conoid and trapezoid ligaments have been torn across or avulsed and they never repair themselves, so that as soon as the apparatus is removed the displacement recurs.

The obvious remedy for this sort of thing is to perform an operation that will restore the ruptured ligaments to something like normal. More or less successful attempts to do this have been made by suturing the torn ligaments with catgut or silk or by tacking down avulsed ligaments with metal tacks. Such operations, however, often prove disappointing because the scar upon which the repair must depend is liable to stretch and so allow the displacement to recur. This has been the common experience in ruptures of the quadriceps and patellar tendons.

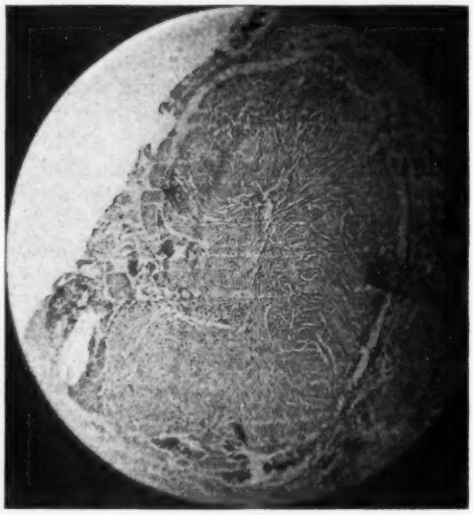

FIG. 1. Low power photomicrograph of a cross-section of a living suture made from fascia, recovered 18 months after implantation.

The discovery that fascia lata and tendon would continue to live practically unchanged after transplantation from one place to another in the same individual has done much to solve the difficulty. By means of them it is possible either to repair old ligaments or to make new ones and if certain points in technique are observed, to restore joints, even after prolonged disability, to normal.

I have here a few slides which illustrate the well-known viability of transplanted fascia and tendon. The photomicrograph (fig. 1) shows a living suture of fascia lata recovered eighteen

months after it was inserted. It demonstrates the way in which a flat strip of fascia will fold up into a cylindrical structure like a tendon and continue to live unchanged, as far as its microscopic appearance is concerned. Figure 2 shows

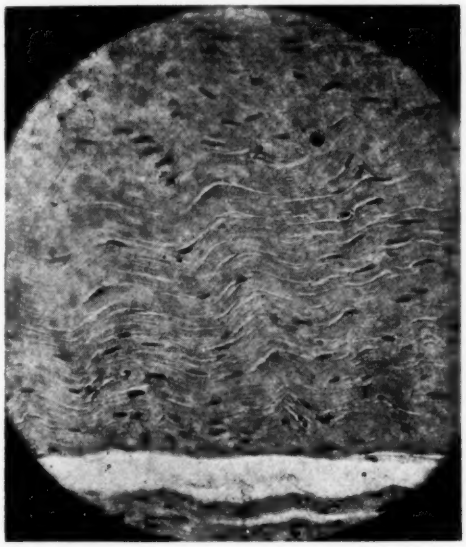

FIG. 2. High power photomicrograph of living suture made from fascia, cut longitudinally, recovered 18 months after implantation.

the same strip of fascia cut longitudinally and demonstrates the normal structure of fascia even after eighteen months' transplantation.

If one proposes to repair a rent in a ligament or in a tendon which forms part of the capsule of a joint, no better suture material can be found than living fascia lata. It can be threaded into a needle and moved backwards and forwards like catgut or silk and, if the grip of the ruptured ligament is secure, the repair that will result will be just as strong and permanent as the normal strain requires. Possibly a more perfect living suture can be made from the tendon of the plantaris or the palmaris longus but I have used these only when they have been exposed in the field of the operation.

It is not often, however, that one finds an opportunity to make an immediate attempt to repair a ruptured ligament as it is rare for these patients to come under the care of a surgeon until it is evident that the conservative methods of treatment have failed. By this time the possibility of closing the rent in the ligaments by any type of suturing is gone, owing to the sealing over of the ends of the ligament and their wide separation from one another. Thus in the dislocations of the acromioclavicular joint, there is no chance of repairing the conoid and trapezoid ligaments even with living sutures. It is in such cases that the making of new ligaments finds a useful place and it is this subject that constitutes the principal part of my lecture.

What I have to recommend has been impressed on me after some satisfactory and many unsatisfactory experiences. The desire to reduce the time of the operation and the risks of infection of the wound have often led to attempts to introduce ligaments where none had existed before and so avoid the more difficult procedure of replacing the injured one. Almost invariably these attempts have failed or have been only partially successful and it has been gradually borne in on me that it is usually folly to try to improve on nature. It is now our plan to study the morbid anatomy of the injury as carefully as possible and then, if an operation is decided upon, to try to replace the injured ligament as perfectly as can be done. This, unfortunately, is often difficult and calls for specially designed technique, as in the case of the shoulder and the knee, in order that the ligaments may be properly placed. It is our definite conclusion, however, that the more perfectly the new ligament can be made to resemble the injured one the more perfect will be the final result of the operation.

The technical difficulties of making new ligaments are all associated with attaching the fascia or tendon to the bones and with securing the proper degree of tightness in the new ligament after it has been inserted. Each of these must be discussed in detail.

The fastening of a new ligament to a bone is not so simple as it might seem. Years ago I pointed out that in the operation of "tendon fixation", done for the purpose of converting the tendons of paralyzed muscles into ligaments, it was necessary to bury the scarified tendon in a tunnel in the bone for a distance of an inch or more. Only then would the adhesion of the tendon to the bone be strong enough to prevent it from pulling out. In the case of new ligaments made of fascia, the amount of adhesion is never sufficient to be depended upon and it is always necessary to do something more to make sure that it holds. The most satisfactory plan has been to tie a knot in the end of the fascia which is oversewn with fine silk so as to prevent it from untying, and then to draw the new ligament through a tunnel in the bone until the knot lodges against the entrance of it. In this way dependence is placed on the knot instead of on the adhesion of the smooth shiny fascia to the tunnel. (Fig. 3.)

Where the new ligament is expected to be subjected to considerable constant or intermittent strain further precautions must be taken in implanting the ligament as strain is very likely to exert destructive pressure on the bone and so allow the new ligament to cut out. I have seen this happen several times after transplantation of the extensor proprius hallucis into the head of the first metatarsal. At first the adhesion of the tendon to the bone was perfectly solid but after a few months the roof of the tunnel in the bone was cut through com-

pletely and the effect of the operation destroyed. To get over this it is a good plan to pass the new ligament through a hole drilled in the bone in the line that the ligament will assume when the operation is completed. By this arrangement the knot is on the opposite side of the bone and cannot possibly cut out. (Fig. 3.)

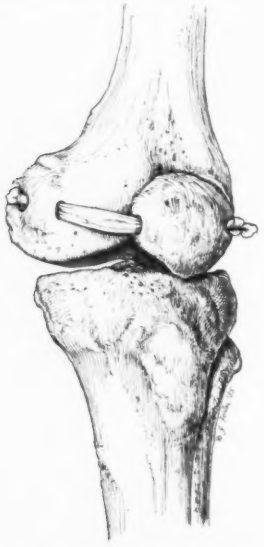

FIG. 3. Operation for the prevention of recurring dislocation of the patella. A strip of fascia lata or semitendinosus tendon has been passed through tunnels in the patella and inner condyle of the femur and prevented from slipping by knots tied on the ends of the transplant.

In fastening fascia or tendon to bones by passing them through drill holes, care must be taken that the drill hole is so placed that it does not seriously weaken the bone. These holes never fill up with osseous-tissue and they always weaken the bone at that point so that fracture is liable to occur if the proper force is applied. For this reason it is unwise to bore holes through the clavicle for the insertion of new trapezoid ligaments.

The tightness of the new ligaments after healing is completed and movements are once more allowed is an important factor in the success of the operation. In those cases in which muscles are attached to the ligaments as in the quadriceps, the ligamentum patellae and the supraspinatus, complete success after fascial repair of the ligaments or tendons may be counted on as the muscles take up any slack that may persist. Where no muscles are attached to the ligaments, however, and where tightness is important, as in the internal lateral ligament of the knee, the making of new ligaments is apt to come short of perfection. It seems to be impossible either to pull up the new ligament tightly enough or to keep it tight enough afterwards to prevent lateral instability in the joint. The best results may be expected in those joints in which the ligament that has been injured is not under constant tension but is called on to act as a check to too wide a range of movement. Good examples are seen in the operation for recurring dislocations of the patella and of the shoulder.

It is not my intention in this lecture to enter at great length into the anatomical details of the treatment as it is applied to the various joints but simply to pick out here and there examples that will illustrate the principles involved.

Recurring dislocation of the patella is perhaps as simple an example as one can find and it is particularly interesting because the structures involved are so close to the surface. This occurs occasionally as the result of an accident which forces the patella outward and tears the inner portion of the capsule, but it is much more often the result of an anatomical anomaly in which the patellar groove is unusually shallow and the capsule unusually lax. Each time the dislocation occurs the capsule is further stretched and the subsequent synovitis makes matters worse. My first case was that of a soldier who sustained a lateral dislocation of the patella when blown up in a trench. The dislocation was reduced but, owing to the marked knock-knee deformity which was present, the tendency was for the patella to slip off again. He was then operated upon and a plication of the capsule between the patella and the inner condyle of the femur performed. This operation proved futile, as one might expect, and the dislocation recurred within three months. When he came under my care some months later the patella was lying on the lateral aspect of the outer condyle and the man was walking only with the aid of crutches. In the operation which was undertaken the patella and quadriceps tendon and the ligamentum patellae had to be dissected free before the deformity could be reduced and the patella was then tethered to the internal condyle. This was accomplished by means of a strip of the tendo Achillis cut from the same leg and passed through holes in the patella and internal condyle. The result in this case, in spite of a gross knock-knee, has been perfect and now, after the lapse of twenty years, the patella continues to swing normally at the end of its tether and the new ligament can be felt easily stretching from patella to condyle.

Since that first operation we have had many opportunities to test the value of the method but in none has there been a better result. To avoid the risk of seriously weakening the tendo Achillis, however, we have abandoned this source of the new ligament and have used fascia lata or the tendon of the semitendinosus. I think I prefer the latter as it provides a long and very strong tendon, the removal of which seems to cause very little, if any, disability. In several cases in which this tendon was well developed, it was split longitudinally and only half or three-quarters of it removed for the purpose of the transplant. At one end a knot is tied and carefully oversewn with catgut or fine silk. The other end is then drawn through a hole drilled transversely through the patella and

another in the internal condyle of the femur and is finally anchored by tying another knot in it and oversewing with catgut or silk. Thus the new ligament will be fastened to the patella and the femur both by the fibrous adhesion between itself and the tunnels in the bone and by virtue of the knots which cannot pull through the drill holes. It is well to make sure that the new ligament enters the internal condyle at a point which is approximately the centre of the circle through which the patella moves during flexion and extension of the knee, and also that the drill hole in the femur is more or less on the line of a projection of the new ligament so

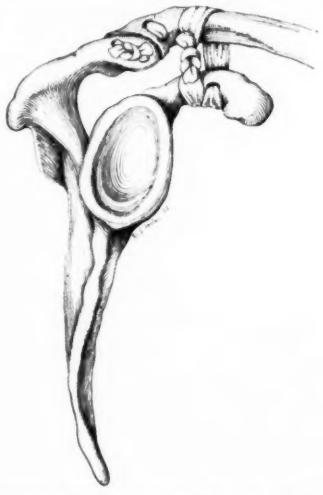

FIG. 4. Bunnell's operation for repair of ruptured coracoclavicular ligaments.

that the tendency to cut out the cortex of the bone or to wear out the ligament itself at the point at which it enters the bone may be reduced to a minimum. (Fig. 3.) (Gallie and LeMesurier, *Brit. J. Surg.*, 12: 289, 1924-25.)

Of the persisting or permanent dislocations one of the most interesting is that of the acromioclavicular joint when this is complicated by rupture of the coracoclavicular ligaments. As mentioned above the outer end of the clavicle slips up over the acromion and rests there like a beam on a St. Andrew's cross, and no conservative measures will have the slightest effect in bringing about a cure. This is one of the best places in which to apply the principle of replacing the injured ligament by a new one and the technique described by Bunnell is an excellent example of it.

The chief point of the operation is the insertion of a new coracoclavicular ligament to replace the ruptured one. This is done through an incision commencing at the clavicle and extending downward across the tip of the coracoid and along the border of the deltoid. (Fig. 4.) The incision is deepened to expose the clavicle and coracoid thoroughly. A strip of fascia lata ¾″ wide and 10″ long is then cut from the thigh and passed subperiosteally over the clavicle and under the coracoid. One of the ends is wrapped once around the coracoid and is finally tied to the other in a triple knot which is carefully oversewn with fine silk to prevent all possibility of loosening. When the knot is being tied the clavicle is pressed down into position and the new ligament is drawn very tight so as to lift the whole scapula up to the clavicle and so make sure of the permanent prevention of redislocation.

Most of the cases that I have seen have come for treatment months after the original injury and by that time the articular cartilage of the acromioclavicular joint had been replaced by fibrous tissue. In these cases the operation just described has been supplemented by the introduction of a new interosseous acromioclavicular ligament. This is inserted in the form of a mattress suture through two drill holes in the end of the clavicle and in the acromion which appear close together in the former acromioclavicular joint. The ends are tied tightly together.

The results of this operation have been excellent. At first we were disappointed because the joint seemed too loose but after we learned

FIG. 5. X-ray of knee joint of man operated on by Alwyn Smith of Cardiff in 1918, in which a ruptured anterior cruciate ligament was replaced by the Hey-Groves method. The tunnels in the femur and tibia are easily seen. This man has a perfect knee.

the importance of drawing the new trapezoid ligament very tight and lifting the coracoid close up under the clavicle our troubles were over and we have come to expect these patients to return to physical labor after a disability period of three to four months.

This is one of the dislocations which should be treated by immediate operation. There is no chance of a satisfactory healing of the coracoclavicular ligaments, no matter what the treatment, so that one might as well save time by going straight ahead and repairing the damage

at once. If this is done, the articular surfaces of the joint can be saved and the patient returned to a condition that is practically normal.

I have always thought that one of the most interesting operations performed on joints is that of Hey-Groves in which he introduces new ligaments to replace torn cruciates. The operation for a torn anterior cruciate is the one most often performed as the injury is much more common than in the case of the posterior cruciate. The results are sometimes perfect. (Fig. 5.)

Injury to the posterior cruciate is rare but decidedly disabling. In order to prevent the backward slip of the head of the tibia it is necessary to have a taut posterior cruciate ligament and this means that if a new ligament is to be effective it must be anchored solidly both back and front. To accomplish this the semitendinosus is cut free from its muscle and dissected down to its point of insertion on the antero-internal aspect of the head of the tibia. It is then drawn through a hole drilled through the head of the tibia to appear in the popliteal space just below the attachment of the capsule of the knee to the tibia. In this way it obtains solid anchorage to the tibia. The knee is then opened in front through a split patella incision and the new ligament, threaded into a sharp pointed bodkin, thrust through the posterior capsular ligament and into the synovial tube covering the remains of the old posterior cruciate and then into the joint cavity. The new ligament is then drawn through another drill hole in the inner condyle of the femur which is so placed that it enters the joint at the point of anterior attachment of the cruciate. In this way the tendon of the semitendinosus is made to lie exactly in the position of the old posterior cruciate ligament and when it is drawn taut, to take on perfectly its function. By keeping the bodkin and the tendon buried in the synovial sheath of the old cruciate, one readily makes the new ligament extra-articular, exactly like a true cruciate, so that none, or practically none, of the tendon is exposed in the synovial cavity. (Gallie and LeMesurier, *Ann. Surg.* 85:592 [April] 1927.)

The success of these operations on the cruciate ligaments depends on the new ligament maintaining tightness and to make sure of this the greatest care must be taken to keep the tendon drawn taut while it is healing to the tunnels in the bone. I prefer the knot on the end of the tendon as the safest way of preventing the development of slackness. A good many surgeons have been disappointed in the results of these operations for the repair of injuries to the cruciate ligaments, due, practically always, to laxity of the new ligaments. This results from some defect in anchoring the ligament and not from the stretching of it as is so often stated.

But while the dislocations of the patella, clavicle and knee provide interesting opportunities for the substitution of new ligaments for old, the really important place for the employment of the principle is in recurring dislocation of the shoulder. This condition is comparatively common and is so disabling that in most instances some form of operative treatment must be tried. Our plan is based on the idea that there is some defect in the capsule in its antero-inferior portion, that is, in the region of the inferior gleno-humeral ligament. Usually this defect is at the attachment of the ligament to the glenoid rim and is due to failure of the ligament to heal to the bone. This may result from wide separation of the avulsed ligament from the bone after reduction of the dislocation or from stretching

FIG. 6. Drawing of dissection by which the antero-inferior border of the glenoid is exposed. The combined tendon of the short head of the biceps and the coracobrachialis have been retracted inward and the subscapularis upward so that the capsule of the shoulder joint is exposed and one's finger or an instrument can be placed on the margin of the glenoid.

of the scar before it has become strong. In addition to these recurring dislocations which result from gross damage to the ligaments there are a few which come on without traumatism and are due to congenital laxity of the ligaments. These as well as the traumatic cases call for the introduction of a new inferior gleno-humeral ligament which will prevent the head from sliding downward and forward out of the glenoid when the appropriate leverage is applied.

A review of the anatomy of the shoulder joint will show that the anterior lower lip of the glenoid is so remote that in order that a new ligament may be attached to it some new technique must be devised. This has been accomplished by the following steps:

Through an incision along the anterior border of the deltoid from the tip of coracoid to a point opposite the tendon of the pectoralis major, the deltoid is separated from the pectoral till the coracoid and the short head of the biceps and the coracobrachialis are exposed. These are dissected away from the head and neck of the humerus and drawn inward. One then sees

the lower border of the subscapularis as it passes over to its insertion into the lesser tuberosity and by blunt dissection in the areolar tissue below it one is able to get under it and retract it upward and inward. One then sees the capsule of the shoulder as it lies on the prominent lower anterior lip of the glenoid and one can confirm this by pressing the finger against it while the head of the humerus is rotated. This is the spot where the old inferior gleno-humeral ligament is normally attached and it is the spot where the new one must also join the bone. (Fig. 6.) To bring this about a large drill is applied to the anterior lip of the glenoid and is driven backwards, upward and inward through the capsule of the shoulder and the neck of the scapula until it bulges the skin just below the spine of the scapula in the back. The skin over the point of the drill is then incised and the drill, in which an eye has been provided at the tip, comes into view. (Fig. 7.)

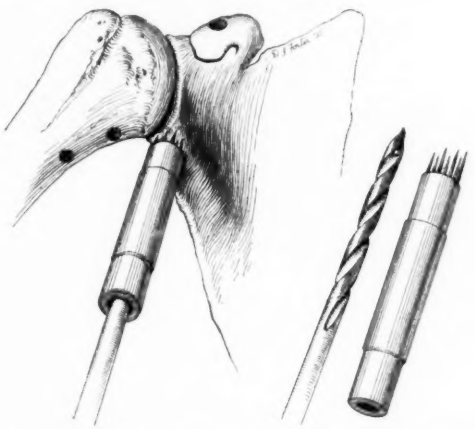

FIG. 7. Drawing to illustrate the drilling of the hole through the neck of the scapula. The casing over the drill prevents accidents to the great vessels and nerves.

In the meantime an assistant has cut a strip of fascia lata ten inches long and an inch wide and tied a knot in one end of it and oversewn it with fine silk. The other end of the strip of fascia has been transfixed and ligated with heavy silk which is passed through the eye of the drill. The drill is now withdrawn and with it goes the silk through the hole in the neck of the scapula. In this way the strip of fascia is drawn through the scapula and with a little manipulation the knot on the end of it is pulled through the incision in the skin and finally comes to rest on the posterior surface of the neck of the scapula. Thus the new ligament is solidly anchored to the edge of the glenoid at exactly the right place. (Fig. 8.)

The operation is then completed by drawing the new ligament through holes drilled in the anatomical neck and shaft of the humerus as shown in the diagram (fig. 9), and finally through a hole in the tip of the coracoid, and anchored there. The new ligament is drawn sufficiently tight that when healing has occurred the range of motion of the joint, in the direction of abduction and external rotation, will be slightly limited.

This operation has been tested thoroughly on thirty-five occasions and has given excellent re-

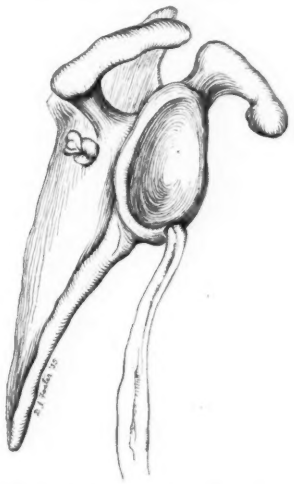

FIG. 8. Drawing of scapula to show how the new inferior gleno-humeral ligament is attached to the bone.

sults. One patient was a well-known football player and he has played through three seasons since his operation, without mishap. One was a professional lacrosse player and one a champion wrestler. Two were epileptic and in each

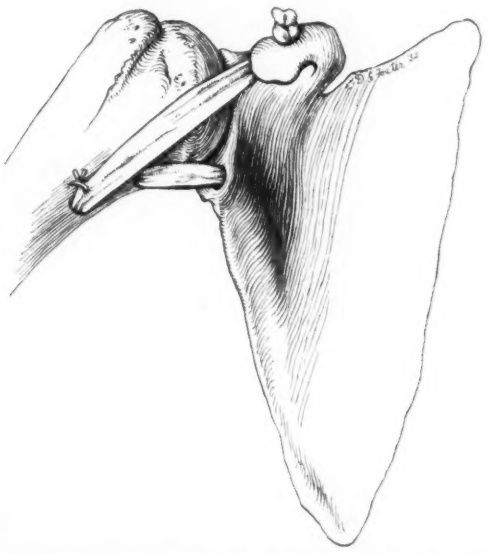

FIG. 9. Operation completed with the new inferior gleno-humeral ligament in place and finally attached to the tip of the coracoid process.

of these both shoulders were operated upon. In one of them a recurrence developed six months after the operation and from the story and the subsequent examination I think the new ligament was either broken or torn out of the bone. The same thing happened to one other patient when carrying a heavy pack sack on his shoul-

ders. His arms were stretched up above and behind his head and as the pack toppled backward he tried to hold on to it, with the result that the head of the humerus slipped out. All the other thirty-three cases have been cured and are without disability of any kind. (Gallie and LeMesurier, Trans. Am. Surg. Assn. 45: 392, 1927.)

One could go on at great length reviewing instances in which ligaments have been repaired or replaced. Thus, dislocation of the sternoclavicular joint, if complete, calls for an operation in which a new costoclavicular ligament is introduced. Recurring dislocation of the base of the metacarpal bone of the thumb lends itself well to the making of a new capsule. Recurring dislocation of the hip can in some instances be cured by plicating the capsule with a living suture of fascia. In fact, if one applies the principle of repairing the damage by restoring the injured ligament to as near normal as possible, many causes of permanent disablement will have been removed. The most serious difficulty one meets with in these operations is the fastening of the new ligaments to the bone so that when they come into use, they are as tight as their work requires. This is particularly so in the case of the internal and external lateral ligaments and the anterior cruciate ligament of the knee. In these injuries I have come to think that strips of fascia lata are not so suitable as segments of tendon because it is impossible to make them adhere solidly to holes in the bone. Thus in rupture of the external lateral ligament of the knee a thick strip of the tendon of the biceps can be cut free from the muscle, leaving it attached to the fibula, and made to replace the ligament by drawing it through a two inch drill hole in the external condyle. If this is drawn tight and anchored with the knee flexed 45° it may be expected to support the joint satisfactorily when healing occurs, for if it was tight in flexion it will certainly be tight when the joint is extended to 180°. Similarly in injury to the internal lateral ligament the tendon of the sartorius or the gracilis can be used to replace the ligament.

The chief point of the matter is that, if operative treatment for these injuries has been decided upon, the anatomy of the part must be reviewed carefully and that technique decided upon that will enable the surgeon to restore both the anatomical structure and the function of the injured ligament most perfectly. This means that textbook instructions can rarely be followed and that the plan for each operation will have to be decided upon according to the pathological condition found. If the few general principles referred to in this lecture are remembered some at least of the pitfalls will be avoided.

The preparation of the material for my lecture tonight has led me into several paths of reading that have given me the greatest pleasure. One was the very interesting history of the Massachusetts Medical Society written by Dr. Walter L. Burrage. In this I found that in his will, George Cheyne Shattuck left a sum of money which was to provide for the collection and publication of historical or other essays on the climate or the diseases of Massachusetts. I knew nothing of the climate of Massachusetts except that when I am here the sun always shines, but I did remember that many distinguished members of this society had studied dislocations, so I concluded that this condition must be particularly prevalent in Massachusetts and could therefore be considered a suitable subject for this Lecture. Another revelation to me, derived from Dr. Burrage's book, was the astounding way in which the distinguished names of a hundred years and more ago, still appear and with equal distinction as the members of this society today. Coming from a new country, as I do, I envy you in the tradition you have built about our profession. For this and many other reasons I regard as the highest honor the invitation you have given me to deliver the Shattuck Lecture and to add my name to the list of distinguished men who have already addressed you.

THE RETICULOCYTE RESPONSE IN GUINEA PIGS FOLLOWING THE ORAL ADMINISTRATION OF CERTAIN ANTI-ANEMIC SUBSTANCES*

BY D. K. MILLER, M.D.,† AND C. P. RHOADS, M.D.†

AMONG the different methods which have been suggested for testing the potency of the purified fractions of liver which are used in the treatment of pernicious anemia the procedure of Jacobson[1, 2] has received particular attention. This procedure depends upon the fact that a certain number of normal guinea pigs react to the injection of particular anti-anemic substances by a rise in the percentage and absolute number of reticulocytes in the peripheral circulation. Experiments which are based upon this observation and which are concerned with the relationship of certain dietary substances to hematopoiesis have been made in this laboratory. The substances which were tested were fed rather than injected parenterally. The results are of interest for two reasons. First: They confirm the experiments of Jacobson which indicate that the mechanism described by Castle[3] for pernicious anemia is also operative in the causation of reticulocyte rises in the guinea pig. Secondly: They show that increases in the number of circulating reticulocytes which are similar in degree, duration, and time of occurrence to those obtained by Jacobson[1, 2] may be induced by potent, anti-anemic substances which are orally as well as parenterally administered.

METHODS

Adult, male guinea pigs weighing from 500-600 grams were employed. They were kept in groups of four in metal cages with shavings as bedding. A standard diet of oats, hay, and cabbage was employed. All of the substances tested were fed daily from graduated pipettes to make certain that the desired amounts were taken. Reticulocyte counts were made daily. Blood obtained by pricking an ear vein was smeared on cover slips upon which a film of brilliant cresyl blue had been dried previously. The preparations were then stained by Wright's method. Five hundred cells were counted. An increase in the average number of reticulocytes to a value of over 2 per cent was considered to be a positive response.

The rice polishings concentrate used was prepared by the Burroughs-Wellcome laboratory. It is known to contain 33 rat-growth units of vitamin B_1 and 0.5 rat-growth units of vitamin B_2 (G) per gram‡. This material has been tested on human beings with pernicious anemia and has proved to be a source of dietary anti-anemia factor. Miller and Rhoads[4]. The autolyzed yeast concentrate (Vegex) has been reported by Strauss and Castle[5] to be a source of dietary anti-anemic factor. The alcoholic extracts of vegex were prepared by bringing a 50 per cent water solution of vegex to the desired concentration of alcohol, stirring thoroughly, filtering through paper, and evaporating the filtrate in vacuo to a volume which was equal to the volume of Vegex originally extracted.

Certain of the substances tested were administered after incubation with normal human gastric juice according to the technic of Strauss and Castle[5]. The gastric juice was obtained after the intramuscular injection of 0.5 cc. of a 1:1000 dilution of histamine hydrochloride. Twelve grams of the substance to be tested were mixed with 150 cc. of gastric juice and incubated for one hour at 37°C. The pH was adjusted before using to 5.5 with concentrated NaOH.

THE SELECTION OF ANIMALS

As shown in table 1 eighty-five guinea pigs were tested for rises in reticulocyte percentages following the oral administration of 0.6 Gm. daily of liver extract Number 343 N. N. R. Of the entire group thirty, or 35 per cent, proved to be suitable for subsequent use as shown by reticulocyte rises to values of from 2 to 7.8 per cent occurring between the seventh and twelfth days after the beginning of treatment. In the remaining animals the average reticulocyte percentage was less than 1 and at no time was

TABLE 1

TESTS OF THE EFFECT ON THE RETICULOCYTES OF NORMAL GUINEA PIGS OF FEEDING 0.6 GM. LIVER EXTRACT NO. 343 DAILY

Diet Supplement	No. of Animals	No. of Animals Reacting with a Rise of Reticulocytes	Level of Response	Day of Response
0.6 Gm. liver extract q.d.	85	30	2-7.8%	7th-12th

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‡The term vitamin B2(G) is used in this publication to refer only to the thermostable vitamin which is required by rats for growth. It has no reference to the heat stable fraction of the water soluble vitamin B complex known as factor PP which is preventive and curative of canine black-tongue and of human pellagra.

greater than 1.8. One positive test was considered sufficient to warrant classifying the animal as one which was capable of giving a reticulocyte response. Such animals were segregated and after a suitable interval were employed to test substances of unknown potency.

TESTS OF RICE POLISHINGS CONCENTRATE AND OF GASTRIC JUICE

The results of four tests of these substances are presented in table 2. In the first the effect of feeding one gram daily of rice polishings concentrate to seven reactive guinea pigs was investigated. No reticulocyte rise occurred in any animal. This fact is considered to be evidence that the substance is without antianemic potency if it is administered alone. In a second test an incubated mixture of the rice polishings concentrate with normal gastric juice was fed to three guinea pigs which had been shown to be capable of responding to the administration of potent material. A reticulocyte rise to between 5 and 5.8 per cent was effective in all three animals between the eleventh and thirteenth days. This result is evidence that some constituent of the rice polishings concentrate was so altered by incubation with normal gastric juice that it gained an hematopoietic potency which had been lacking previously. The third test is similar to the second except that the rice polishings concentrate was autoclaved for four hours at neutrality before using in order to eliminate any effect which might be due to its high content of vitamin B_1. Three of the four reactive animals tested responded with a rise in reticulocytes to between 2 and 3.6 per cent on the eighth and ninth days after the treatment was begun. Gastric juice alone was fed in a fourth test and no response was effected.

TABLE 2

TESTS OF THE EFFECT ON THE RETICULOCYTES OF REACTIVE GUINEA PIGS OF FEEDING RICE POLISHINGS CONCENTRATE AND GASTRIC JUICE

Diet Supplement	No. of Animals Tested Which Had Previously Reacted to the Oral Administration of Liver Extract	No. of Animals Giving Response	Level of Response	Day of Response
Rice polishings concentrate 1 Gm. q.d.	7	0	—	—
Rice polishings concentrate—gastric juice incubate 4 cc. q.d.	3	3	5-5.8%	11th-13th
Autoclaved rice polishings concentrate—gastric juice incubate 4 cc. q.d.	4	3	2-3.6%	8th-9th
Gastric juice alone 2 cc. q.d.	3	—	—	—

TESTS OF AUTOLYZED YEAST (VEGEX) AND VEGEX EXTRACTS

Untreated vegex was tested by feeding one gram daily to each of five guinea pigs which had been proved to be capable of responding by a reticulocyte rise to the administration of liver extract. No effect was obtained, as would be expected from the report of Strauss and Castle[5]. After the vegex had been treated by incubation with normal gastric juice, however, the feeding of one gram daily resulted in a positive response in three out of five instances. Reticulocyte rises to from 2.2 to 3.4 per cent occurred on the ninth to the eleventh days after treatment was begun.

TABLE 3

TESTS OF THE EFFECT ON THE RETICULOCYTES OF REACTIVE GUINEA PIGS OF FEEDING VEGEX AND VEGEX EXTRACTS

Diet Supplement	No. of Animals Tested Which Had Previously Reacted to the Oral Administration of Liver Extract	No. of Animals Giving Response	Level of Response	Day of Response
Vegex 1 Gm. q.d.	5	0	—	—
Vegex gastric juice incubate 4 cc. q.d.	5	3	2.2-3.4%	9th-11th
95% alcoholic extract vegex	4	0	—	—
90% alcoholic extract vegex—gastric juice incubate 4 cc. q.d.	2	2	3.2-5.4%	12th

In a third test four known reactive animals were fed a 95 per cent alcoholic extract of vegex without effecting any change in the reticulocyte levels. When a similar extract was fed after incubation with gastric juice both of the two test animals gave positive responses. The reticulocytes rose to between 3.2 and 5.4 per cent between the tenth and twelfth days.

This result is in keeping with the report of Strauss and Castle[5] concerning the hematopoietic potency of alcoholic extracts of vegex after incubation with gastric juice.

DISCUSSION

The usefulness of the reticulocyte rise in reactive guinea pigs as a test for potent antianemic substances can be established in only one way. It must be shown clearly that the induction of the reticulocyte rise depends upon the same pathological mechanism as that which obtains in the human being with pernicious anemia. That mechanism is not wholly clear but one finding is encountered with great constancy. The gastric juice of the patient with pernicious anemia is incapable of converting certain dietary constituents into a factor which is required for normal blood formation. Such a conversion can be effected by normal gastric juice. From these two facts certain conclusions as to the etiology of pernicious anemia have been drawn. The experiments reported indicate that the factors inducing the reticulocyte rise in the guinea pig are similar to those causing hematopoiesis in human beings with pernicious anemia. In the absence of a crystalline substance, however, it cannot be said with absolute certainty that the substance inducing the reticulocyte production is the same in the guinea pig as in the patient with pernicious anemia.

CONCLUSION

The reticulocyte response in suitable reactive guinea pigs presents certain similarities in its causative mechanism to that obtaining in human beings with pernicious anemia.

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THE EARLY CLASSIFICATION AND EARLY DIAGNOSIS OF CANCER OF THE BRONCHUS*

With An Analysis of Thirty-One Case Reports, Including Three Pathological Diagnostic Errors

BY MILTON S. LLOYD, M.D.†

As our knowledge of carcinoma of the bronchus increases, our opinions must be revised. A study of the literature on the subject, both here and abroad, leads only to confusion in diagnosis and hopelessness in prognosis. The author is of the opinion, however, that, with a well-ordered knowledge of the clinical syndromes of the disease and the proper application of our present technical methods, the diagnosis can always be made early. Rapid strides are at present being made in the field of thoracic surgery and the anatomical structure of the lung offers some advantages for the total extirpation of malignant tumors. The author believes therefore, that a number of these growths, if found early and favorably situated, should be placed together with carcinoma of the larynx, among the malignancies with a definitely hopeful prognosis.

To draw these conclusions from a series of cases, few of whom were diagnosed early and practically all of whom are dead, would seem, at first sight, to be unjustifiable. But an analysis of the data here presented and a study of many other case reports, both published and unpublished, show that symptoms definitely indicative of carcinoma of the bronchus, existed and persisted, frequently for months and sometimes for years, before even an x-ray of the chest was taken. B. M. Fried[1] in one of the best treatments of the subject, yet to appear in print, states reassuringly, "The frequency of metastases in bronchiogenic cancer in man diminishes with the distance from the central axis of the body." At the same time from the admittedly late cases now being seen, records of successful surgical removals are appearing in the literature with increasing frequency.

Two important conclusions therefore appear. The first is that the early diagnosis of cancer of the bronchus is an urgent necessity. The second is that the clinical apprehension of the disease lags unjustifiably, in view of the mass of information extant upon the subject. The reason for this retardation undoubtedly arises from the fact that little has been done to lead the clinician through the multiplicity of confusing details which may beset the early diagnosis. A departure from the usual methods of treatment would appear to be indicated. To say the least the subject needs further study and clarification.

If, in the following lines, the author presumes to take issue with many of the well-known au-

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thorities, it is not because he wishes in any way to deprecate their efforts. On the contrary he is willing to acknowledge them as the source, either directly or indirectly, of most of the information and all the inspiration of which he is possessed.

CLASSIFICATION

A clinical classification which serves no purpose for diagnosis, prognosis or treatment is useless. Miller and Jones[2] in their study of thirty-two cases, laid down a classification of ten types. There is little however in their grouping to assist in rounding out clinical syndromes. Fried[1] concludes, "From the material studied it is apparent that a reasonable classification of bronchiogenic cancer based on clinical features is as superfluous at the present time as that based upon their gross anatomy." The present author does not feel that this statement applies to-day. It must be realized that any attempt to study the early clinical manifestation of carcinoma of the bronchus from the end picture seen upon the autopsy table, cannot be more productive of results than an attempt to learn the causes of the World War by visiting the battle fields of France. The only way to master the clinical course of cancer of the bronchus is to study it clinically.

Fortunately the anatomy of the chest and the mechanics of respiration are such, that a simple and sane subdivision of these tumors, covering their common and important symptoms, can be easily made. If the thoracic cavity is examined dimensionally, it will be found that the bifurcation of the trachea is situated almost exactly at the geometric centre of the air bearing tissue of the lungs. As Nelson[3] states, "This can be expressed diagrammatically, by imagining the chest to be a sphere, the centre of which is the bifurcation of the trachea. . . ." Departing from this point the cavity may be divided into three zones, viz., a central or hilar zone, a middle or bronchial zone and a peripheral or parenchymal zone. The clinical phenomena will depend in large part upon the zone in which the new growth primarily takes origin. The cause of symptoms in the three groups may be assigned as follows:—

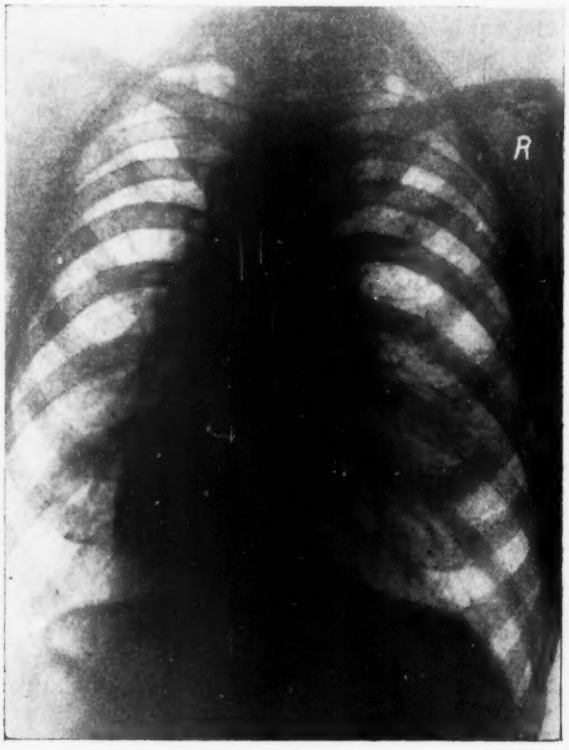
Central Zone	Hilus Infiltration
Middle Zone	Bronchial Obstruction
Peripheral Zone	Centrifugal Expansion

To these must be added the rarer types of "Miliary Carcinosis," which are principally of anatomicopathological interest and the type of carcinoma which is "bronchiectatic" or according to Letulle "cavitaire d'emblée"[4] and which should be in the early stages diagnosed by an accidental bronchoscopic finding.

Tumors of this group, fortunately the least common, spring from the lower part of the trachea and from the stem bronchi. Due to the solid structure of the air passages in this region dissemination of malignant cells is in part controlled. Infiltration takes place by extension along the bronchial walls or the vascular structures, into the lung and the hilus glands or by direct invasion of the surrounding tissues. Their anatomical location and their proximity to important structures, may bring dysfunction of other organs or remote symptoms into the picture. On the other hand obstruction, due to the ample size of the airways, occurs late.

Bronchial Obstructive Group

These growths arise in the second division or smaller bronchi. From the periphery of the lung up to this point, drainage is effected, principally by bronchial and ciliary movements.



HILUS INFILTRATING GROUP.

FIG. 1. Case 1. Carcinoma arising in the lower end of the trachea and involving the esophagus by direct extension. Principal symptoms: substernal pain four months, dysphagia two weeks.

There ensues the usual train of the clinical manifestations of impaired drainage up to complete obstruction with atelectasis or pneumonia. The paths of infiltration are similar to those in the central zone group, but their distance from the mediastinal structures delays the direct involvement of other organs.

It seems unnecessary under this heading, to introduce, as has been done by some authors, special subdivisions, depending upon the presence or absence of cavity or the varying degree of patency of the bronchus.

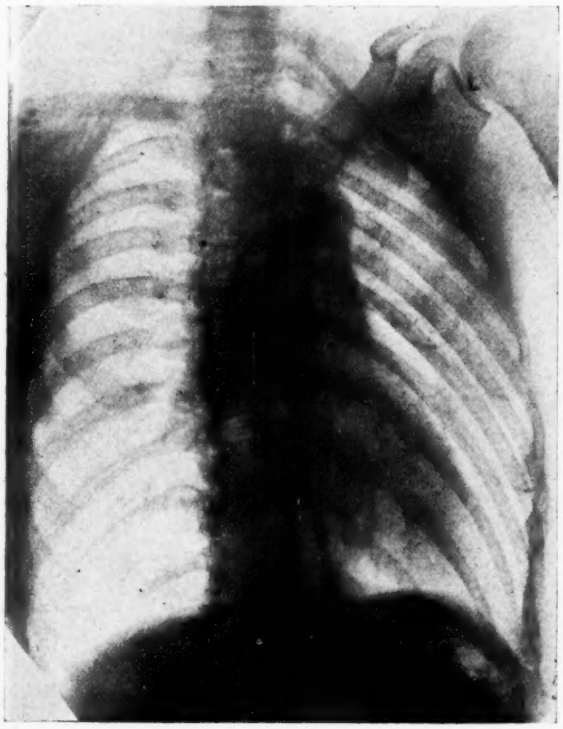


FIG. 2. Case 1. X-ray photograph of the barium filled esophagus. The pipe stem character of the middle portion of the tube is notable. A slight filling defect at the level of the sixth posterior interspace corresponded with the site of the lesion.

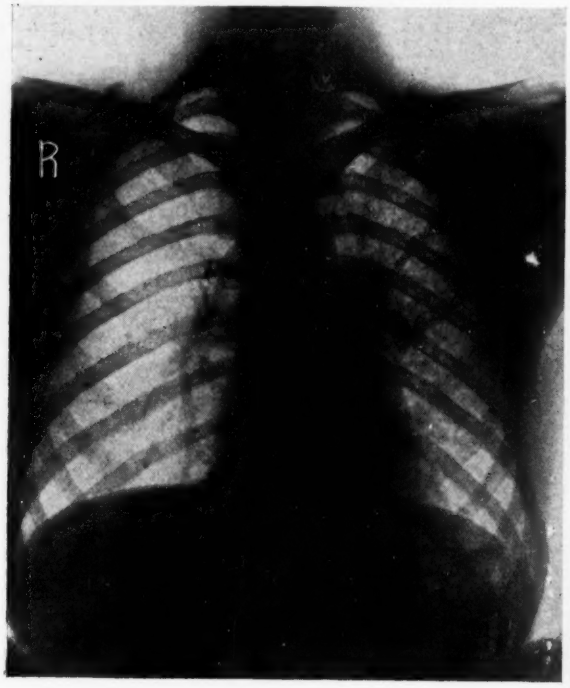


FIG. 3. Case 2. Carcinoma arising in the left stem bronchus. Principal symptoms: cough, dyspnea, substernal pain, seven months very severe pain left side of neck and left arm, three months. Marked loss of volume of the left lung is visible, together with radiating striations representing lymphatic extension into the pulmonary field. Such films are frequently interpreted as "interlobar plastic pleurisy". Bronchoscopy fourteen weeks prior to this x-ray showed the secondary characteristics of infiltrating new growth. Biopsy, however, was reported "fibrotic nodule".

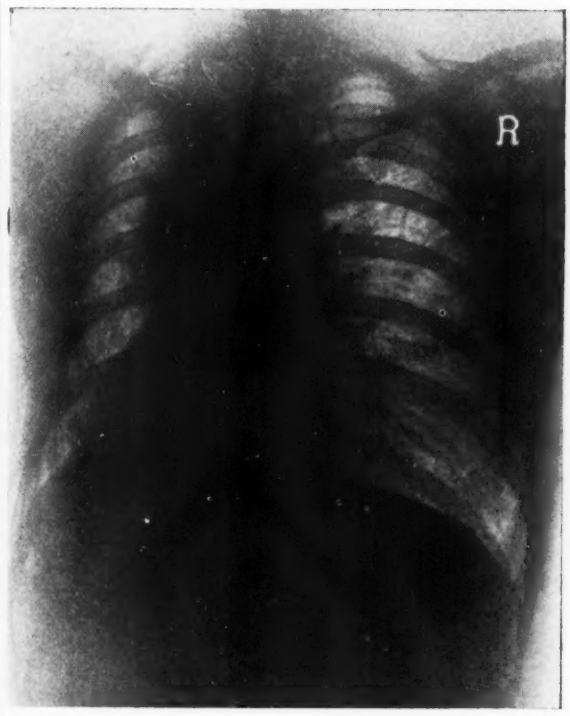


FIG. 4. Case 3. Carcinoma arising in the left stem bronchus. Principal symptoms: severe pain left upper chest and neck four months, cough and dyspnea two months, hemoptysis two weeks. Almost complete absence of air from the left lung. Striations may be seen in the right lung similar to those on the left side in Fig. 3. An exploratory thoracotomy showed massive involvement of the mediastinum.

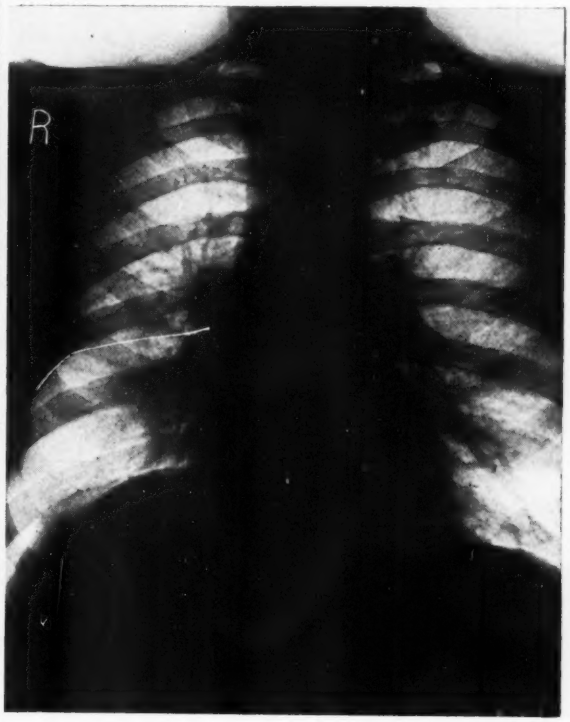
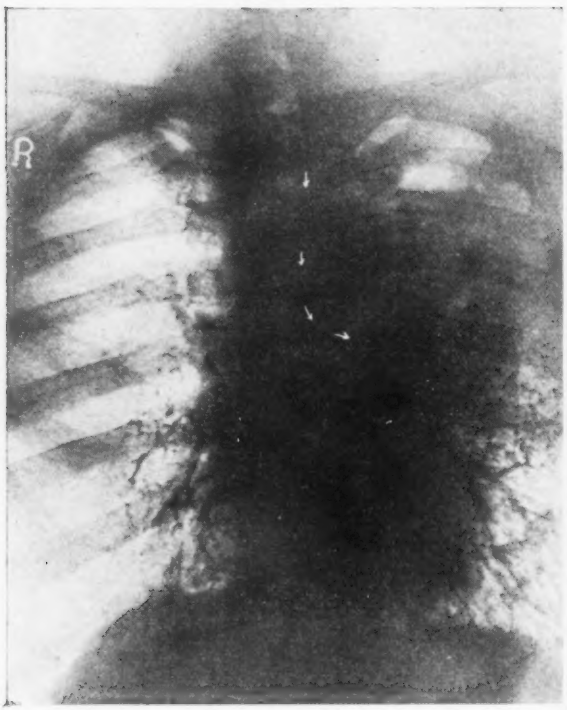


FIG. 5. Case 4. Carcinoma arising in the right stem bronchus, level of the middle lobe bronchus. Principal symptoms: cough five months, pain three months, hemoptysis one week. Most important physical sign: asthmatoid wheeze. X-ray shows shifting of the mediastinum, downward rotation of the interlobar fissure (retouched), and early lymph glandular and vascular infiltration.



BRONCHIAL OBSTRUCTIVE GROUP.

FIG. 6. Case 5. Carcinoma arising in the left upper lobe bronchus. Principal symptoms: "bronchitis", pain, dyspnea, cough and hemoptysis, six months. Lipiodol injection reveals marked retraction of the trachea. The upper lobe is completely atelectatic and a cavity with fluid level is present in the apex. This patient lived for two years after this picture was taken without treatment.

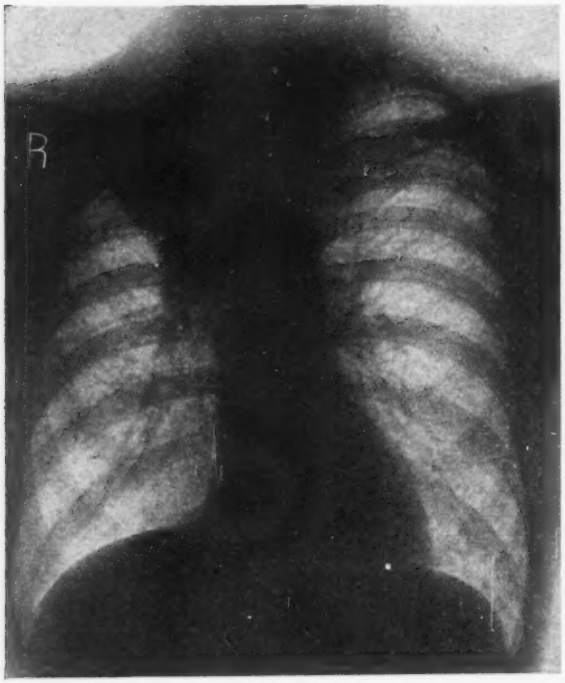


FIG. 7. Case 6. Carcinoma arising in the right upper lobe bronchus. Principal symptoms: cough, hemoptysis one year, dyspnea two weeks. Most important physical signs: asthmatoid wheeze and after breathing. Complete atelectasis of the right upper lobe with typical rotation of the interlobar fissure.

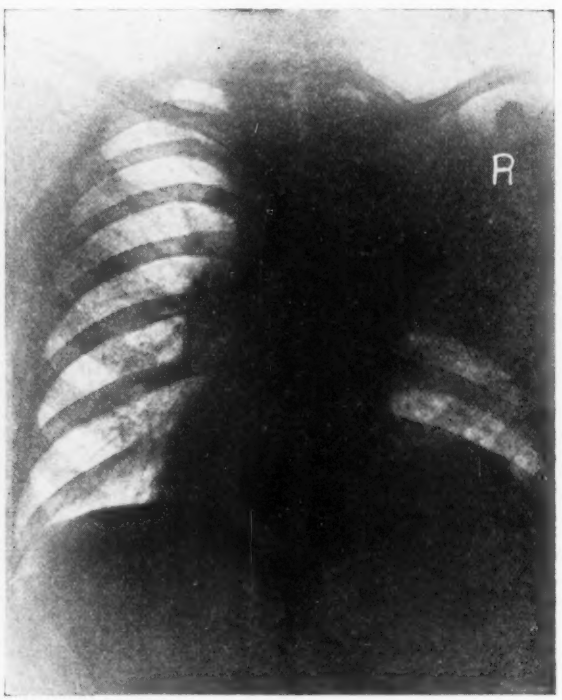


FIG. 8. Case 7. Advanced carcinoma involving the right upper and middle lobe bronchi. In this instance the phrenic nerve is also involved.

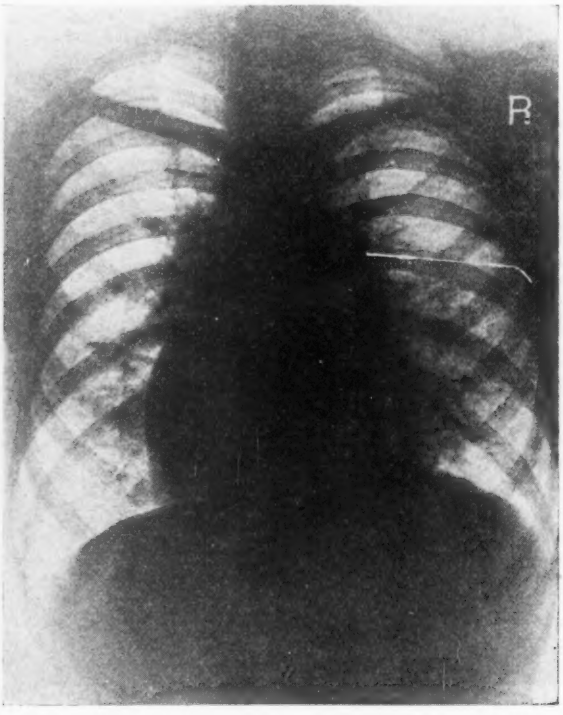


FIG. 9. Case 8. Early carcinoma arising in a second division branch of the right lower lobe bronchus (fourth division from trachea). Although this growth was no larger than the head of a match, impaired drainage with early atelectasis is already present. The interlobar fissure has rotated downward one interspace. (Interlobar fissure retouched.)

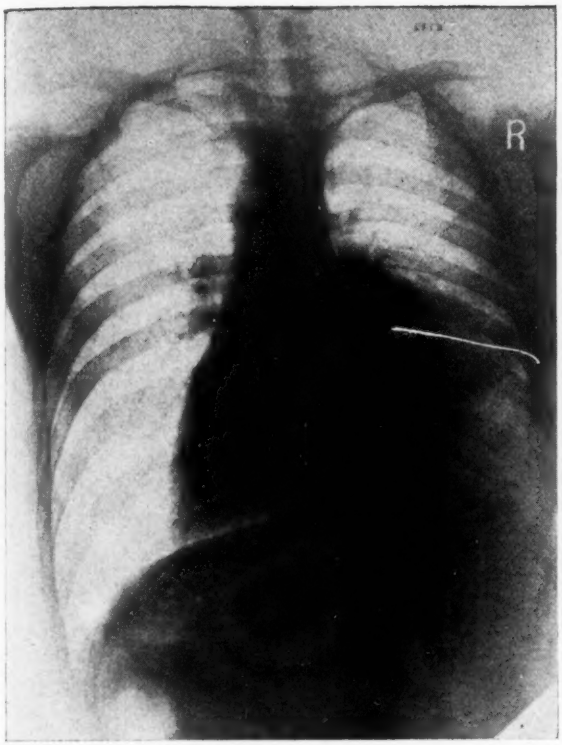


FIG. 10. Case 9. Carcinoma involving the right lower and middle lobe bronchi. This patient had a metastatic growth in the brain. (Interlobar fissure retouched.)

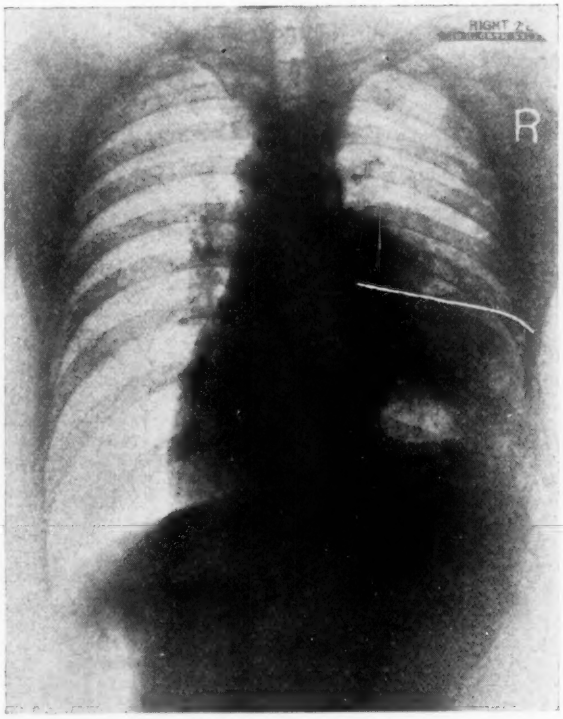


FIG. 11. Case 9. Repeat x-ray following the spontaneous evacuation of the bronchus of a plug of tissue and mucus. The fallacy of introducing a separate classification to cover this eventuality is obvious. In spite of restored patency of the bronchial lumen, the lower lobe has suffered a loss of volume as compared with fig. 10, taken five days previously. (Interlobar fissure retouched.)

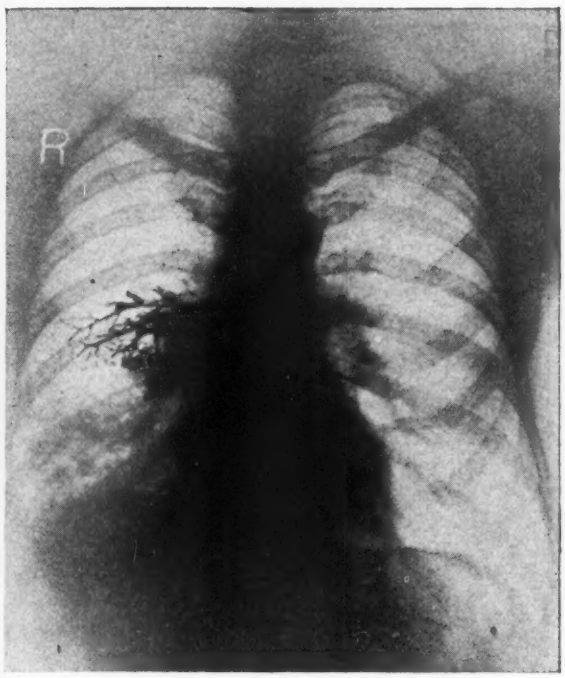


FIG. 12. Case 10. Lipiodol injection in a case of carcinoma of the right lower lobe. The patient had just recovered from "pneumonia". This examination demonstrated the necessity for bronchoscopy and forestalled the proposed cure of a winter in Florida.

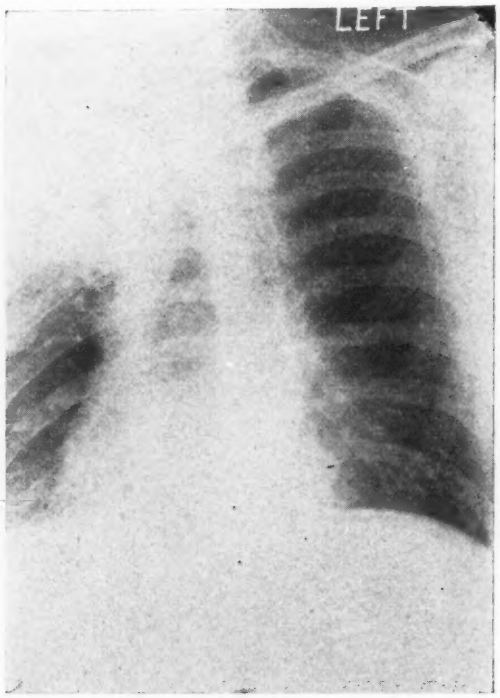
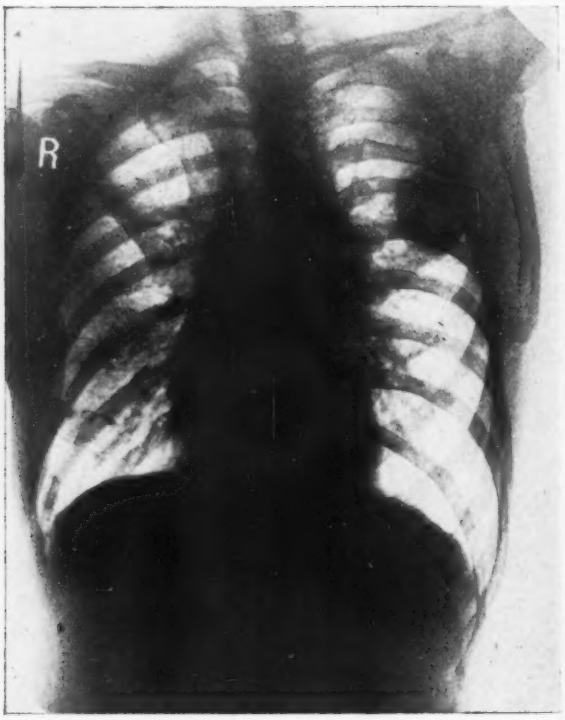


FIG. 13. Case 11. Carcinoma of the right upper lobe bronchus simulating lung abscess. Principal symptoms: eight ounces daily foul expectoration, clubbing of the fingers. A cavity with fluid level is visible. Bronchoscopy negative for new growth. Diagnosis made by biopsy at second stage thoracotomy for drainage of abscess.



CENTRIFUGAL EXPANSIVE GROUP.

FIG. 14. Case 12. Carcinoma arising in the parenchyma of the left upper lobe and contacting the chest wall below the scapula. Localization was made by x-ray and thoracoscopy and diagnosis by punch biopsy. In this case limited movement on the left side was the indication for x-ray of the chest.

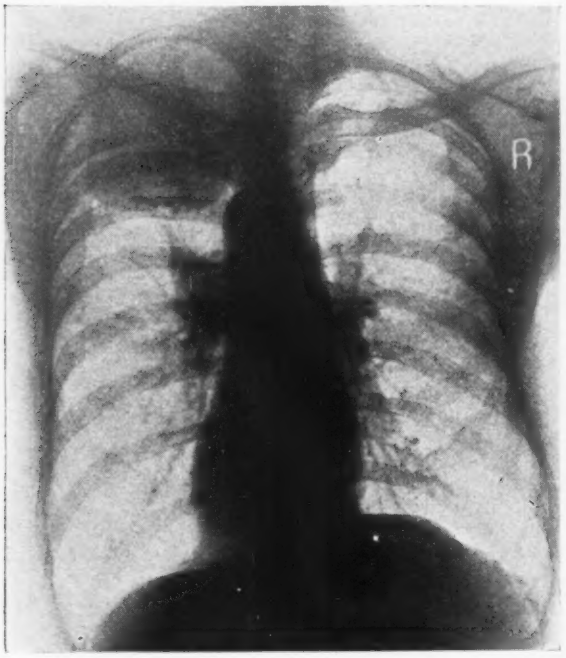


FIG. 15. Case 13. Carcinoma arising in the parenchyma of the left upper lobe. Principal symptom: severe pain left shoulder. The remaining features of the syndrome of superior pulmonary sulcus tumor were absent. Marked pressure distortion and destruction of bone can be seen. With the exception of evidence of external pressure on the tracheal wall, bronchoscopy was negative. Diagnosis made at operation.

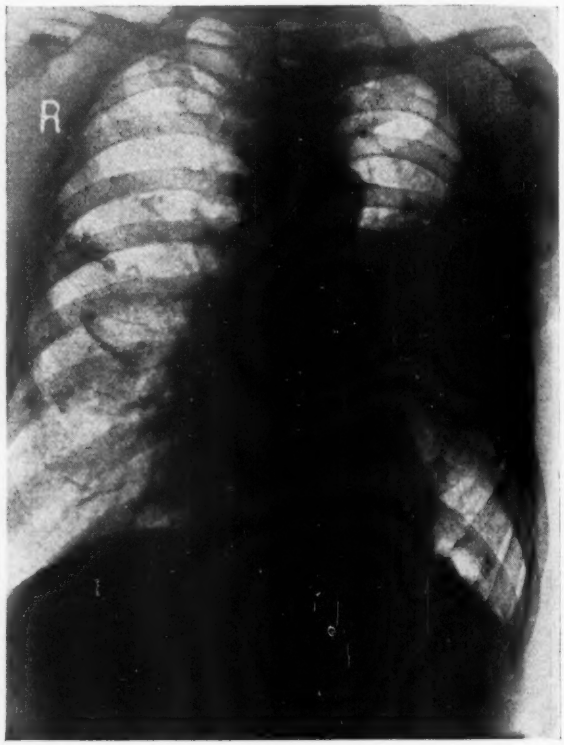


FIG. 16. Case 14. Carcinoma arising in the parenchyma of the left upper lobe. The shadow of the tumor is obscured by the presence of an effusion. Principal symptom: very severe pain of the "intercostal neuralgia" type. Diagnosis made by biopsy of a left axillary gland.

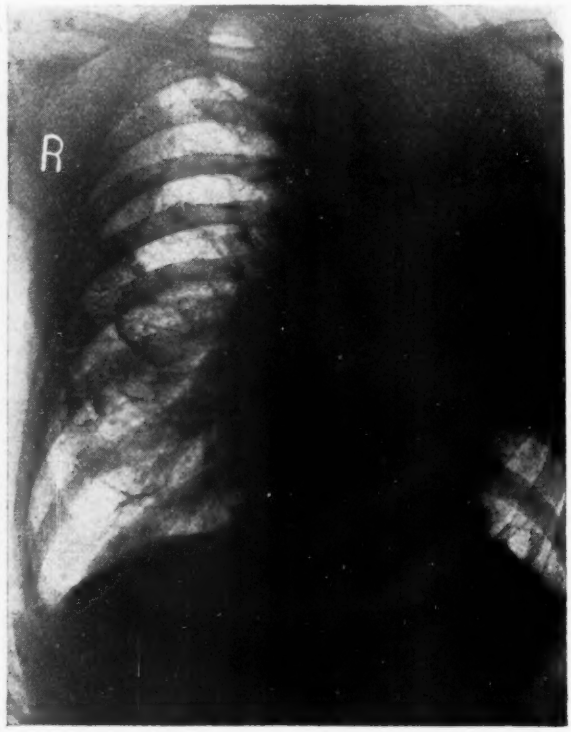


FIG. 17. Case 14. Repeat x-ray two months later. The gradual involvement of an entire hemi-thorax obliterates the "group" characteristics and makes classification from the end picture almost a clinical impossibility.

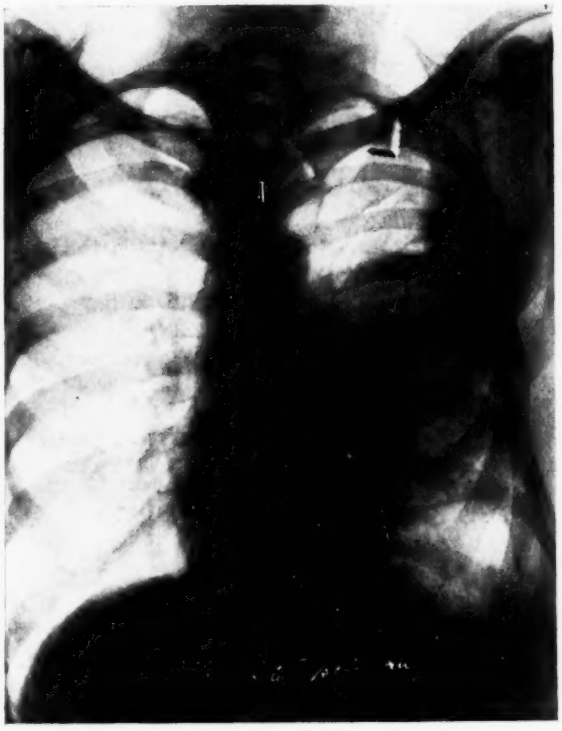


FIG. 18. Case 15. Complete atelectasis of the left lower lobe. Symptoms entirely gastric. Biopsy at this time reported "carcinoma", later changed to "adenoma". Note elevation of the diaphragm and shadow at the first interspace simulating cavity with fluid level.

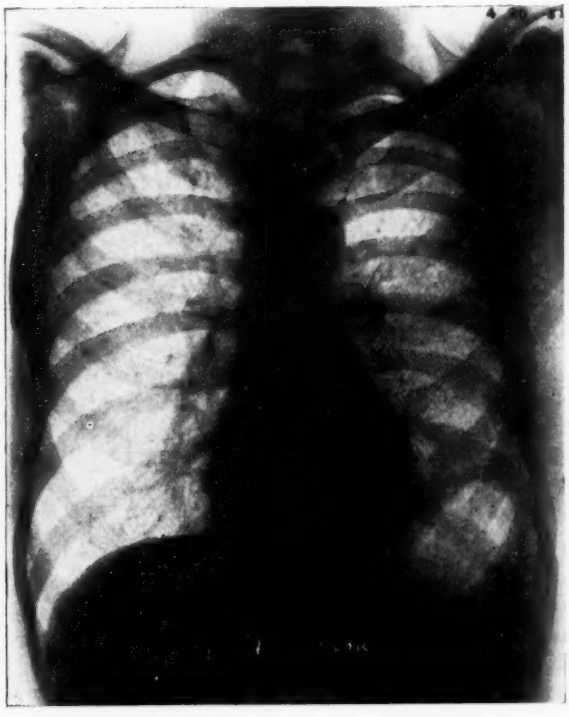


FIG. 19. Case 15. X-ray taken ten months later. Condition has remained the same with no evidence of recurrence for three and one-half years. The diaphragm remains elevated, probably due to adhesions. The patient had been operated on twice for gastric ulcer and once for adhesions and ventral hernia.

Centrifugal Expansive Group

A cancer arising in the air bearing tissue of the lung (terminal bronchiole or alveolus) is surrounded by a soft spongy medium offering reduced mechanical resistance to its expansion and that resistance approaches equality on all sides. The resultant tumor is round and frequently sharply defined and continues to grow centrifugally, until some structure is reached, which alters the destiny of its shape or course. The most frequently involved structures are the pleurae and the chest wall. Without involvement of the chest wall, these tumors are the most likely to be overlooked clinically in the early stages and are the most difficult in which to obtain early pathological and diagnostic confirmation. With involvement of the chest wall, the diagnosis is simplified but the prognosis is impaired.

EARLY DIAGNOSIS

Like any other disease, cancer of the bronchus cannot be diagnosed in its early stages by any single sign, single instrument or single procedure. The clinician must be alert to its possible existence in every syndrome, however trivial, involving the health of the lungs and the specialist must often be prepared to exhaust every means at his disposal, before a final diagnosis is established.

Symptomatology

The complaints presented by the patient, in order of frequency, follow: the percentages given refer to the particular series of cases reported herewith, the less common symptoms being placed under their separate groups.

a.	Cough	Early 90%, late 10%
b.	Pain	Early 70%, late 20%
c.	Dyspnea	Early 40%, late 30%
d.	Pneumonitis (bronchitis, colds, grippe, influenza, pneumonia)	Early 40%, late 30%
e.	Hemoptysis	Early 30%, late 20%
f.	Loss of weight	Early 30%, late 65%
g.	Asthma	Early 5%, late 15%

It must be noted that the early symptoms of cancer of the bronchus are, as a rule, suggestive of some much less important disturbance. Their true significance, however, soon reveals itself in the "atypical" onset or course, which will, subsequently, be examined in greater detail.

Hilus Infiltrating Group

Symptoms may be local or remote, depending upon the structures involved. Substernal pain and discomfort and pain in the shoulder, radiating up the neck or down the arm via the phrenic nerve and the cervical or brachial plexus, are the outstanding complaints. The pain varies from a sense of discomfiting tightness under the sternum to a constant, unbearable, shoulder ache from which the patient desperately seeks relief.

It is not, however, of the localized burning character, below the sternum, associated with acute bronchitis.

There may be difficulty in swallowing, gastric dysfunction, hoarseness or cardiac disturbance, due to direct extension of the growth, or involvement of the nerve leading to the organ concerned.

Cough, in the opinion of the writer, is generally present much earlier than admitted by the patient in the usual history, due to the association of tuberculosis with chronic cough and the racial abhorrence and apprehension of that disease, and hemoptysis and dyspnea are important, if not always early complaints.

Bronchial Obstructive Group

With this group, cough is the chief complaint. Due to the impairment of drainage, there is retention of secretions and a localized bronchitis. The patients find difficulty in "clearing the lungs" and the cough takes on the character of a paroxysm, in many cases, in their effort to obtain relief. The amount of sputum is increased in nearly all cases, and it frequently contains blood. Frank hemoptysis may appear early and then disappear without recurrence for an interval of weeks or months.

In this group, is also heard, particularly the story of repeated "colds" with chills and fever, from which the patient may have been confined to bed on more than one occasion, with recovery "almost but not quite complete". At the same time there is a gradually increasing difficulty in obtaining sufficient air, which finally amounts to a shortness of breath. There is generally some degree of pain which may best be described as a pulmonary distress, or it may accompany the episodes of fever in the nature of a pleurisy, lasting or evanescent.

Remote symptoms are relatively few, except when a rapidly developing atelectasis on the left side causes gastric disturbance by elevation of the diaphragm.

Centrifugal Expansive Group

The peripheral zone group probably have a "silent period", during the earliest stages, when the patient may realize that something is amiss, inside the chest cavity, but can scarcely describe his sensations. The earliest case seen by the author in this group, described his feeling as a "sense of oppression" and a "weakness in the lung". Later, however, when the pleura is involved, pain may be stabbing and severe. If the intercostal nerves are directly affected there may be a neuralgia of such severity as to require blocking of the trunks at the vertebrae, and when the growths are apically placed, pain in the shoulder closely simulates that experienced with the central zone group. (The relation of the so-called Superior Sulcus Tumor[5] to these intrapulmonary apical growths, has not, at this writing, been definitely determined.)

Cough, while generally present at an early date, is not distressing and hemoptysis, in this series, did not occur.

Physical Examination

The most constant and most important physical sign is a limitation of movement on the side of the affected hemithorax. Laennec's contraction, with drooping of the shoulder and "winging" of the scapula may be marked. The trachea is frequently shifted to the affected side. Neumann[6], speaking in reference to cancer of the upper lobe, states, "The most valuable diagnostic sign of these cases . . . is a solid (starre) dullness in the medial portion of the infraclavicular fossa, which encroaches upon the manubrium, even reaching its opposite border, but which does not fuse with the cardiac dullness." While this may be true of the far-advanced cases, it cannot be said to apply to the early, or even the moderately advanced cases, regardless of their site of origin. On the contrary, shifting of the mediastinum more frequently carries the hyperresonant note of the emphysematous contralateral lung, toward the affected side.

Hilus Infiltrating Group

The central zone tumors present the greatest diversity of signs: Horner's syndrome[5], inequality of the pupils, paralysis of the vocal cords, slowing or irregularity of the heart beat, diminished respiratory excursion (sympathetic, phrenic or vagus nerve involvement), stasis in the jugular and mammary veins or edema of the arm. The percussion note is not altered early in these cases, except for a widening of the mediastinal dullness, which is difficult to demonstrate dependably. The diagnosis should be made by other methods before the later physical signs appear.

Bronchial Obstructive Group

Growths in the middle zone are nearly always accompanied by some degree of atelectasis and consolidation or effusion, with an associated decrease in resonance and fremitus. Signs heard through the stethoscope vary from day to day, even from hour to hour, depending on the patency of the bronchus. They are constant, however, in the broader sense, that they always indicate a unilateral bronchitis or asthma, a localized atelectasis or effusion or one of their combinations. Even when these patients are suffering from "pneumonia" with high fever and prostration, the bronchophony is subdued and mixed with a variety of rhonchi and never corresponds in intensity with the degree of dullness obtained upon percussion, but is roughly parallel with that normally heard in the interscapular area. The partially atelectatic, par-

tially consolidated lobe serves as a filter, suppressing the finer, but allowing the louder sounds to come through. If the patient is asked to take a few deep breaths, pronouncing the word "nine" with each expiration, the differentiation of the consolidation of cancer and that of true pneumonia may be dramatized. An alternation of bronchophony during expiration and silence during inspiration will replace the usual accentuation of both phases, found in true pneumonia.

These episodes terminate in "unresolved pneumonia", a term which has entirely lost its meaning and has no place in the medical vocabulary of to-day.

Among the most positive signs, must be mentioned the asthmatoid wheeze[7] and after breathing[8]. These may be only rarely present in the early cases, but when recognized, are pathognomonic of obstruction to the lumen of a bronchus. The asthmatoid wheeze must not be confused with the laryngeal wheeze sometimes produced by a nervous patient, when respiration is under conscious control. The best way to familiarize oneself with this sound is to spend a few sessions in a bronchoscopic clinic where it can frequently be heard through the bronchoscope with unmistakable clearness and intensity.

Centrifugal Expansive Group

It is possible for tumors in the peripheral zone to attain considerable proportions without revealing any other clue to their presence than diminished respiratory movement. Rounded tumors may also be tangential with the chest wall below the scapula and so escape detection in the early stages.

On the other hand early invasion of the pleura produces local signs which simulate, or represent when present, a circumscribed effusion, while apical infiltrations[5] require as far as physical signs are concerned, careful differentiation from the fibrotic type of tuberculosis. Enlargements of the regional lymph nodes, axillary or cervical are not, uncommonly, an early finding.

X-Ray Signs 3'

In the general run of cases the x-ray may be depended upon to reveal more information than any other method of examination. The findings are characteristic for each of the three groups.

Hilus Infiltrating Group

Due to the absence of air as a contrast medium, the presence of these tumors in the early stages is most easily overlooked. Widening of the mediastinal shadow or bulging of the tumor mass into the airways or the lung field and fixity, rigidity or deformity of the esophageal lumen are characteristic of direct invasion. With peribronchial infiltration there is reduction in size of the hemithorax, shifting of the trachea and mediastinum toward the lesion and accentuated radiating striations from the lung root. Individual increases in the width or density of these shadows may produce triangles at the lung root with the apex pointing peripherally or broad bands extending into the lung field. In the latter there is danger of misinterpretation as "interlobar plastic pleurisy", but the multiplicity of radiations of lesser importance, found in cases of infiltrating new growth, should prevent the commission of this error.

In all cases, elevation of the diaphragm on the affected side, and particularly progressive elevation as revealed by serial x-ray films is significant.

Bronchial Obstructive Group

In this group are found the usual signs of complete or partial atelectasis of a lobe or part of a lobe. This process may be solitary or it may be associated with a suppurative necrosis or a simple degeneration in the cancer tissue, producing cavitation. Either of these complications to a fixed lobar atelectasis is sufficiently typical to permit of accurate interpretation to the experienced eye. When, however, the atelectasis is incomplete, the differentiation becomes more difficult and the lesion might easily be mistaken for a chronic, localized inflammation of the lung. Three possible diagnoses emerge under these circumstances: pulmonary tuberculosis, pulmonary suppuration (including foreign body as an exciting cause) and new growth.

Tuberculosis can be ruled out by the history, the absence of tubercle bacilli in the sputum and the relative indemnity of the remainder of the homolateral and the totality of the contralateral lung fields.

From chronic suppuration, the differentiation is not so easy. In distribution, however, these lesions tend to be limited by anatomical boundaries, lobule or lobe, while the extent of the shadow of new growth is characteristically self-limited (within the lobe). In chronic suppurative processes, where atelectasis and inflammation begin together, the pleura is generally involved before any extensive degree of shrinkage has taken place. Adhesions form between the parietal and visceral layers and the subsequent loss of volume of the involved lobe drags its content away from the level of these attachments. In new growth of the bronchus on the other hand, where atelectasis precedes or may remain free of inflammatory complications, pleural adhesions occur late and offer no mechanical impediment to the uniform shrinkage of the lobe. This is most easily detectable on the right side where shifting of the interlobar fissure is one of the striking accompaniments of these conditions. The x-ray film, in consequence, reveals this fissure carried upward or downward, in the direction of the lesion. In inflammations the peripheral end is retarded in movement, while in new growths the peripheral end

either moves with or advances beyond the remainder of the line. In other words, inflammatory lesions are characterized by a convexity of the interlobar fissure in the direction of the shift, whereas new growth shows either a straight line or a concavity in the direction of the shift. This advance movement of the lateral end of the inferior border of the atelectatic shadow, in upper lobe tumors, has already been pointed out by Golden[9].

It has also been claimed by certain authors, notably Santé[10], that obstructive emphysema may occur in tumors of this class, if a suitable intrabronchial impediment to the movement of air is developed. In the opinion of the writer, however, this is not the case. Loss of volume of the involved lobe starts with the beginning of impaired drainage and before obstruction occurs, the lobe is so reduced in size by the chronic atelectatic and infiltrative process, that a check-valve mechanism could scarcely reinflate it, even to its normal size. No photographic record of this condition has, to this author's knowledge, appeared as yet in the literature.

A point of lesser importance but equally noteworthy, is the fact that in inflammatory lesions (including tuberculosis), cavitation in the midst of the circumscribed or mottled x-ray shadows produces sufficient rarefaction to bring the Haversian system of the bones into detailed relief within its contours. In bronchial carcinoma, however, the opacity of the surrounding lung is sufficiently great to obscure bone detail, even in the centre of the shadow of a cavity.

Centrifugal Expansive Group

In the peripheral zone the shadow of the tumor mass is probably round until some important structure is encountered. Unfortunately, due to the absence of well-defined signs and symptoms in the early stages, x-rays are not often taken before the pleura is involved. The shadow is then obscured by collateral infiltration, effusion or atelectasis. Not infrequently bone destruction has already taken place.

SPECIALIZED DIAGNOSTIC METHODS

Carcinoma of the bronchus is rapidly being placed in line with other malignant diseases, where an early diagnosis is only made by the alertness of a good clinician and roentgenologist who establish the indications for biopsy wherever possible.

Bronchoscopy

Undoubtedly among the specialized methods for the obtainment of biopsy material, bronchoscopy ranks first. In practically all growths of the central zone and in the majority of the middle zone group, tissue can be taken from the tumor on direct examination. When seen, they are generally far enough advanced to be cyanotic, fungating and ulcerated with a secondary, acute, localized bronchitis. In cases of complete or nearly complete obstruction, quantities of mucopurulent material mixed with blood are retained distal to the mass and expelled upon the restoration of patency to the bronchial lumen.

Occasionally the removal of a biopsy specimen may instigate hemorrhage of disturbing severity. This blood should be sucked out to prevent accumulation in the bronchus or flooding of the branches leading to other lobes or the opposite lung. It is rarely dangerous and can always be controlled. By passing the end of the tube beyond the site of the lesion, the escape of blood is stopped by pressure and if it recurs the bronchus may be packed by narrow tape, attached to a strong thread leading out of the patient's mouth, the whole being left in situ for an hour or two. At any rate, the operator should never retreat from the field at the sight of an unusual amount of blood, as a subsequent atelectasis with fever and prostration will almost certainly replace the customary amelioration of symptoms, which follows the opening of a bronchus and the draining of the involved lobe.

Even when the necessary pathological confirmation cannot be secured in this way, a number of typically characteristic and strongly positive observations may be made. The trachea is commonly shifted toward the lesion, its wall or the wall of a bronchus bulges into the lumen, there are rigidity and fixity both in respect to motility and mobility, and the mucous membrane, instead of presenting the normal corrugations corresponding to the cartilaginous rings, may be uniformly smooth and pale or dull, thick and lustreless.

Accurate as bronchoscopy may be in the majority of bronchial new growths, it has little or no value in tumors arising in the smaller branches or the parenchyma of the lung, 35 per cent of the cases in this series. Two years ago a well-known internist in this city asserted that he would rather allow his patient to die than to advise his submission to bronchoscopic examination. Happily the acquisition of improved technical methods by a continually increasing number of men has long since removed the justification for such paternally protective measures. Bronchoscopy can always be carried out safely, without pain, under local anesthesia and frequently leads to the discovery of a benign growth or an unsuspected foreign body, which can be removed with every prospect of complete cure. An early bronchoscopy with negative results is always better than a late one with positive findings, but a negative bronchoscopy simply means that one method of diagnosis has failed. Jackson and Jackson[11] in their latest edition of the masterly treatment of the subject of peroral endoscopy state, "It is now generally accepted

that the bronchoscope affords the only means of making an early and positive diagnosis of malignant disease of the bronchi and lungs." Perhaps this attitude should not be too greatly stressed, as the mistake of considering this method as the only reliable procedure is certain to retard the diagnosis of a number of cases on the basis of exclusion and to allow them to drag on to a hopeless consummation.

Pneumothorax and Thoracoscopy

Effusion into the pleural cavity is a common accompaniment of carcinoma of the bronchus. In the peripheral zone group it occurs as a direct result of invasion of the visceral pleura by the malignant cells. Under these circumstances diagnostic tap may produce a hemorrhagic liquid containing cells which are useful in diagnosis. A clear straw-colored effusion is, however, equally typical. In the middle zone group, effusion in the early stages is more likely to be a part of the general picture of the complicating "pneumonia". A chest tap produces a clear liquid without blood or tumor cells. There may even be a spontaneous clearing of these collections, together with the subsidence of fever and other acute clinical symptoms when the bronchus is opened by accident or by design.

At the same time that a specimen of pleural fluid is taken for laboratory study a useful diagnostic move can be made by evacuating the entire content and replacing it with air. X-rays taken following this procedure will show a density of the involved lobe, much greater than that seen in other clinical types of pleurisy with effusion. There is also revealed a marked reduction in the volume of the lobe and a corresponding emphysema of the remainder of the lung or a portion of the border of the tumor mass may be brought to light.

In the peripheral zone group, even when no fluid is present, a great deal of information may be gleaned by creating a pneumothorax and inspecting the pleural cavity from inside by means of a thoracoscope. Although the author has attempted to do so on several occasions, he has never succeeded in obtaining biopsy material from the pleural surface of the lung. Adhesions are not always present at the site of the tumor even when it is near the surface[12]. If the patient is seen early enough this procedure should be a practical possibility in a limited number of cases without danger of traumatic collapse of the lung. At the same time secondary characteristics, corresponding in importance to those seen in bronchoscopy, may be observed. The pleura is lustreless and boggy in appearance over the affected lobe. There is a reduction in mobility of the lung, increasing to complete fixity as the pleural attachments are approached. The cardiac impulse instead of being transmitted by the normal wave-like fluctuation of the lung surface, becomes a massive rise and fall of diminished amplitude in the involved lobe. At the site of attachment between the two pleural layers, the string and band adhesions of an inflammatory process are absent and a circular fusion on a broad base is seen. The angle between the two pleural layers at the line of approximation instead of being acute as in inflammatory processes is rounded out by the spread of the malignant cells.

In cases where tumor tissue cannot be obtained the thoracoscope may also be of considerable assistance in judging the operability of the case. It may also assist in localization for the next procedure either by transillumination of the chest wall or by the guidance under direct observation of the end of an exploring needle inside the pleural cavity.

Punch Biopsy

When the tumor has been accurately localized by x-ray or thoracoscopy or both, a biopsy trocar can be inserted directly into the mass for the taking of tissue. Crossing free pleural space should be avoided. Even the peripherally located growths are surrounded by an area of impaired drainage and retained infection. The danger of empyema is obvious.

Operative Biopsy

In the experience of the writer, metastatic glands, especially in the neck and axilla, are found more frequently in the peripheral zone group than in those more centrally located and always it would appear after the pleura has been reached and infiltrated.

In one case of this series where the diagnosis was in doubt and where biopsy tissue could not be obtained there was an associated pulmonary suppuration. In this instance a two-stage operation was deliberately done with the object of draining the abscess and at the same time of removing tissue for pathological examination. Naturally the possibility of a chronically draining malignant sinus was visualized. The patient was immediately placed under deep x-ray therapy when the diagnosis was established and the sinus closed with surprising rapidity. The question is therefore left open as to how frequently this method should be used.

Bronchography

The injection of opaque substances into the bronchial tree can be carried out as an office procedure. It may show obstruction, stricture or deformity of the bronchial or tracheal lumen. In this way the necessity for bronchoscopy may be graphically demonstrated to the patient or his responsible associates. It should never be used as a substitute for bronchoscopy. The author has never used this method of examination in the bronchiectatic type of tumor and cannot therefore speak of its value.

DIFFERENTIAL DIAGNOSIS

The author willingly subscribes to the protean manifestations of this disease and to the many difficulties to be overcome before an accurate diagnosis can be made. He believes, however, that the disease can be diagnosed always in its early stages if the observer will train himself to be clinically sensitive to certain well-defined criteria. These may be individual and pathognomonic or inter-related and "atypical" but nevertheless indicating the next step in diagnostic procedure. Most of the errors, both of diagnosis and differential diagnosis, can be avoided by observing the following rules:

Substernal pain is nearly always a sign of important disease and demands thorough investigation.

A chronic cough with pain or dyspnea or both is rarely tuberculosis and should never be so diagnosed unless proved by repeated positive sputum examinations.

A constant chest pain should arrest attention and vagaries in chest pain demand immediate clarification.

In cases of pain in the shoulder extending up the neck or down the arm, look for Horner's syndrome, venous stasis, hoarseness, dysphagia.

"Unresolved pneumonia" is not a diagnosis and frequently masks cancer of the bronchus.

An apparent recovery from an "atypical" pneumonia does not rule out cancer of the bronchus.

Hemoptysis where the x-ray is negative or indefinite is an indication for bronchoscopy (suspected aneurysm excepted).

Diminished respiratory movement or diaphragmatic excursion if unilateral and not part of a clearly defined clinical entity is an indication for x-ray study.

Asthmatoid wheeze or after breathing are diagnostic of bronchial obstruction and are indications for bronchoscopy.

Unilateral bronchitis or unilateral asthma are indications for x-ray and bronchoscopic study.

A negative bronchoscopy, or the finding of tubercle bacilli in the sputum, does not rule out cancer of the bronchus.

Diminution in size of a hemithorax or shifting of the interlobar fissure with concavity toward the lesion is highly suspicious of carcinoma of the bronchus.

Elevation of a diaphragmatic dome, especially progressive elevation, is worthy of wide investigation.

SUMMARY

An analysis of the observations made on twenty-eight cases of primary carcinoma of the lung and three cases of pathologic diagnostic error are presented.

A classification is offered of three groups, which, in the author's opinion, demonstrate a logical and serviceable interrelation between the anatomical situation and the clinical expression of the disease, and under these group headings the signs and symptoms are presented in an attempt to delineate definite clinical syndromes.

In order to maintain simplicity, the rarer forms, e.g., miliary carcinosis, bronchiectatic carcinoma and those with remote metastases have not been brought into the discussion. With the same purpose symptoms of a pulmonary arthropathic nature, directing attention to the inflammatory lung complication rather than the primary disease, such as, clubbing of the fingers and rheumatoid manifestations, are excluded from the typical clinical pictures. Discussion is likewise limited intentionally, to the early clinical findings in each group, wherever the later clinical features might cause confusion by overlapping with another group.

The application of the different technical methods which may be serviceable in diagnosis is discussed.

ANALYSIS OF CASE REPORTS

Of the thirty-one cases upon which this paper is based twenty-eight ran a typically malignant course and three cases although diagnosed carcinoma by examination of material obtained at biopsy through the bronchoscope, ran, subsequently, a benign course.

The malignant cases were all white males of the average age of forty-five years, the youngest thirty-six years and the oldest sixty-eight years. The occupations varied greatly and apparently had nothing to do with the etiology of the condition. Of these cases twenty-five are now dead and the remaining three are rapidly approaching death. Of the twenty-five who died, twenty-four lived for one year or less after the diagnosis was made. One case lived for two years and it is worthy of note that he was among those who received no treatment curatively intended.

Erythrocytopenia and leukocytosis were characteristic. The average red cell count was 4,106,000 per cu. mm. and the average white cell count was 14,900 per cu. mm. The increase in white cells appeared to be associated with pulmonary inflammatory complications.

Bronchoscopy proved to be the most useful diagnostic method. Seven cases were not bronchoscoped because of the patients' poor clinical condition, metastases to the brain or the bones of the neck or shoulder, or because the tumor was so near the periphery of the lung that no purpose could be served. In the remaining twenty-four cases, satisfactory biopsy material was obtained in seventeen. Tissue obtained from the remaining seven cases was reported normal in five, chondroma in one and fibrotic nodule in one. It must be credited to the value of bron-

choscopy, that in two fatal cases, where no malignant tissue was found microscopically, definite secondary, intrabronchial, malignant characteristics could be observed and in three cases where microscopic evidence of malignancy was seen, but the subsequent course was benign, the bronchoscopic diagnosis was, congenital web of the bronchus, papilloma of the bronchus and fibrochondroma of the bronchus.

In view of these observations the author feels that a shadow of doubt is cast over the accuracy of previously reported cases of malignant disease of the bronchus "cured" by removal through the bronchoscope. The latter three cases have now been under observation for periods of from three and a half to four and a half years and it is difficult to believe that the mere removal of tissue from within a bronchus, or even the removal of a pedunculated growth, could completely eradicate a true carcinoma. It is much more logical to assume that carcinoma of the bronchus may fall into the category of growths, such as appear in the urinary bladder, where the establishment of the grade or even the existence of malignancy is known to present insuperable difficulties on some occasions. Similarly, in spite of the death-dealing qualities of the average cancer of the bronchus, the possibility of malignant potentialities making a delayed appearance in an apparently benign growth, cannot be entirely denied. In this series, two cases suffered from cough, loss of weight and occasional hemoptysis, over a period of eight years prior to their last illness, according to the onset given in their personal history. In both of these cases, however, death followed within six months of the occurrence of symptoms leading to the diagnosis of cancer of the bronchus. The question whether such tumors do or do not exist can only be answered by repeated bronchoscopic and biopsy examinations of suspected cases over long periods of time. A check-up of this kind was pursued for a period of three years in the three cases brought into question above, but in each instance the diagnosis was finally reversed.

Subdivided according to location, one tumor arose from the trachea to the right of the bifurcation, nineteen were in the right lung and eleven in the left. There were of the Hilus Infiltrating Group, five cases; Bronchial Obstructive Group, twenty cases (seventeen mal—three benign); and Centrifugal Expansive Group, six cases.

In the single instance of tumor arising from the trachea the first symptom was dysphagia due to infiltration of the wall of the esophagus.

All cases in the peripheral zone showed involvement of the pleura and chest wall. In three instances destruction of bone had already occurred. One of these patients exhibited a definite "Pancoast Syndrome" of "Superior Pulmonary Sulcus Tumor." So distinctive, indeed, is the clinic of this type of tumor that it almost isolates itself and defies classification with other tumors of the lung.

The author is indebted to a number of his medical colleagues for assistance in many ways. To assign credit to them individually would be impractical. He especially desires, however, to mention the names of Dr. L. T. Perrault and Dr. R. F. Harloe for assistance in the collection of clinical data and to Dr. W. E. Youland of the Flower Hospital for a critical review of the pathological material.

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For a more complete bibliography the attention of the reader is especially directed to references 1 and 2 above.

THE NEW HAMPSHIRE MEDICAL SOCIETY

SCIENTIFIC SESSIONS

THE One Hundred and Forty-Fourth Annual Meeting of the New Hampshire Medical Society was held in the Ballroom of the Hotel Carpenter, at Manchester, New Hampshire, on Tuesday, May 7, 1935, at ten forty-five o'clock in the morning, with the President, Dr. Frederic P. Lord, presiding.

PRESIDENT LORD: Gentlemen of the New Hampshire Medical Society. The One Hundred and Forty-Fourth Annual Meeting of our Society is now in session.

I have the honor to present to you the Right Reverend John B. Peterson, D.D., Bishop of Manchester, who will give the Invocation.

BISHOP PETERSON: Almighty and Eternal God, Whose Son on earth went about doing good, healing the sick, giving speech to the dumb, hearing to the deaf and life to the palsied limbs of the sick, bless these, Thy followers who, in the same work of mercy, are doing God's work for the preservation of humankind.

His work is to create a perfect manhood, a perfect humanity, but the accidents and the mistakes of life have left a wreckage by the wayside.

Bless the efforts of these, Thy servants, to restore life, vitality, health, to the failing members of society, and give them as their reward the fruits of Thy promise made by Thy Divine Son; "I was sick and you visited Me. Whenever you did a service of this kind, you did it to Me."

May this service be upon them and their deliberations, and make it a spectacle of the self-sacrifice of the medical profession! Encourage them in their work and comfort them in their adversities!

May God bless them all at their meetings! Amen.

PRESIDENT LORD: One of the pleasures in coming to Manchester, as we have so many times, is to see and hear one of our fellow members, the Mayor of Manchester, on whom I shall call to give us the Address of Welcome.

HON. DAMASE CARON, M.D.: *Mr. President, Bishop Peterson, and Members of the New Hampshire Medical Society* — For the fourth time during my administration as Mayor of the City of Manchester, it has been my privilege to welcome the New Hampshire Medical Society in Convention assembled. I may say without exaggeration that in every instance this function has brought me new pleasure.

Your Society, gathered here for its One Hundred and Forty-Fourth Annual Meeting, has studied for nearly a century and a half the most perfect creation of God—Man, so that during its existence he might vanquish his enemies of the exterior and those of the interior from the abuses of the pleasures of life, so that he might alleviate the sufferings of his fellow-men in order that life may not be considered in vain.

But our work as members of the medical profession should not be adopted if we declared that our only purpose is the welfare of the people. The progress of science is our motive and it is the accomplishment of a duty; because of this sacred trust, we must not only fit ourselves for the work, but do all in our power to advance the science of medicine.

We should advise and assist those who are fitted for its practice, and forever drive from the fields of medicine and surgery those who are a menace to life and health and an insult to our noble calling.

We must be consistently alert and studious in order to keep abreast of scientific research, so that those who are depending upon us for health and strength may not be disappointed, and so that our profession may profit through our efforts.

Gentlemen, the City of Manchester is here to welcome you. It wishes you much success in your deliberations, and it congratulates you upon your worthy accomplishments.

PRESIDENT LORD: You will now have a report of the Committee of Arrangements given to you by the Chairman of that Committee, Dr. George T. Sheehan.

DR. GEORGE T. SHEEHAN: *Mr. President, Ladies and Gentlemen*—It is my great pleasure to extend to you a very cordial welcome on behalf of the Manchester Medical Society. I also wish to thank the members of the various committees who so willingly gave their time so that you might enjoy yourselves during your brief visit here.

There are two important factors which I wish you would consider during your stay here. The first one is this. Do not forget our Exhibitors. Even if you do not make a purchase, the salesmen at the various booths will be glad to welcome the opportunity to display their wares. I believe this year we have the largest display we have ever had. Now, the exhibitors at the southern end of the hall do not seem to get the "breaks", because everybody crowds around the doors; so please go to the southern end of the hall so that you may look around there also.

The other important factor is the banquet tomorrow night. Assurances have been given by the Committee in charge that it will be enjoyed by all, physically and mentally.

May your visit here be enjoyed to the utmost. The City welcomes you, and it is open for your entertainment.

PRESIDENT LORD: Before we start the Scientific Sessions, I have one announcement to make in fairness to all of the speakers. The members of our Society are allowed twenty minutes and no more. The speakers who are announced on the program for discussion are allowed five minutes. The extemporaneous speakers are allowed three minutes. It is necessary to give you a minute's notice by tapping on the table before your time is up so that you may finish in your allotted time.

The Scientific program opens this morning with a paper on Congenital Pyloric Obstruction by Dr. Chester F. McGill of Portsmouth.

The following two papers were also read:

"Constipation", Fred E. Clow, Wolfeboro. Discussion opened by Edward C. Batchelder, Dover, Richard W. Robinson, Laconia.

"Amoebiasis in a Rural Community", Frank H. Connell, Hanover. Discussion opened by Norman W. Crisp, Nashua, Harry T. French, Hanover.

TUESDAY AFTERNOON, MAY 7, 1935

The Session re-convened at two-forty o'clock in the afternoon.

PRESIDENT LORD: The afternoon session will please come to order.

Gentlemen, I do not know that there is any particular credit involved in living a certain number of years in itself. We can't help that; it is inevitable. But there is an immense amount of credit in living fifty years in certain ways.

It has been the custom of this Society at each Annual Meeting to recognize the members of the Society who have been in active practice and who have been members of this Society for fifty years.

This year we have one member, who is our Exhibit to-day. He has been a member of this Society for fifty years. It is the custom to give such members a gold medal, which I will shortly pin upon his coat, but I think as you look at him, and as you hear him, you will realize that he has already achieved the gold medal that all of us are looking for; the ability, even without the practice of his profession which he has given up, to live happily and enjoy life. I now present to you Dr. Edward H. French of Potter Place.

DR. EDWARD H. FRENCH: *Mr. President and Gentlemen of the New Hampshire Medical Society*—I never enjoyed the sorrows and joys of medical practice, that is, of a general practice, as I have always been in hospitals for the insane, where I spent forty-five years of my professional life. Then I went into the World War, which was crazier than anything I ever experienced before.

I don't know what I have done to deserve this medal. I have never made any great discovery, nor have I invented a surgical instrument, but I think I must have received it as the honest increment of a professional career.

PRESIDENT LORD: At this time, gentlemen, it has also been the custom of this Society to recognize other members who have been in active practice for fifty years, although they are not yet members of the Society for fifty years.

Among the list we have today, I shall ask first if Dr. Louis W. Flanders of Dover will rise, and I shall also ask him to say a few words to us.

DR. LOUIS W. FLANDERS: The truest words that have been said here to-day are that "we can't help it". And you can't help being in practice fifty years either. When one has been in practice fifty years, he is likely to become garrulous and reminiscent. I want to avoid that. But I do want the privilege of claiming the usual thing, that I have lived in the best fifty years the country has ever seen. I say "the usual" thing, because my grandfather wrote that in his diary more than seventy-five years ago. I think it is truer to-day than for many years past, because if I can read the signs right, it will be only a few years more before some laywoman in Concord will ring the bell and you young fellows will have to go to work.

This is the bargain-counter age. The butcher is not asked to sell his meat at half price, and the baker is not asked to give away his bread, but the doctor is commanded to sell his wares at half the cost. Already, we have tonsillectomies three for twenty-five, and I expect to see before very long at St. Aloysius "Appendectomy Day—Ordinary Catgut Sutures—A Good Job $25.00—No Scar $35.00." Or, perhaps we shall pick up the evening paper and see something like this: "St. Aloysius Hospital—Notice to Expectant Mothers. To those women who can arrange to have their children come upon the same day, this will give you notice that we will take care of you in lots of ten for $5.00 each." And that might be signed "Dr. I. Go. Gettem, Chief of Staff."

Well, the result, unless I am very much mistaken, will be that in a very short time, there will be the greatest shortage of doctors this country ever saw, because young men will not practice medicine under any such restrictions. Consequently, I am very glad to see that these few

words of mine are being taken down, and I hope that they will be published in the transactions, because at the end of the next fifty years, I shall be quite curious to see if my prophecy came true.

PRESIDENT LORD: It gives me the greatest of pleasure to call next upon Dr. Frank E. Kittredge of Nashua.

DR. FRANK E. KITTREDGE: *Mr. President, and Gentlemen of the Society*—I have not Dr. Flanders' wit, and I shall make no attempt at a speech, but I want my young friends, particularly the young men around Nashua who do work such as I do, not to think for a moment that fifty years of practice in medicine or of receiving honorable mention places me upon the shelf. As Dr. Flanders has said, I believe that I have practiced medicine during the best medical period in history. I think that the doctors during the past fifty years have been more interested, have been able to do their work with a greater degree of comfort than they ever will be in the future.

Now, if there are those among you who ever will stand where I am now standing, or who have practiced medicine for the greater number of fifty years, and who have received as much satisfaction and as much fun out of the practice of their profession as I have received out of practice, you certainly can rest assured that you made no mistake in the choice of your calling.

PRESIDENT LORD: I hate to voice this suspicion, but I think that a little detective work would reveal, in reference to the last two speakers, that somebody has been tinkering with the birth certificate records.

I am going to ask if Dr. Frank S. Lovering of Moultonboro is here.

[There was no response.]

Is Dr. William S. Manuel of Portsmouth here?

[There was no response.]

Is Dr. Edward E. Twombly of Colebrook here?

[There was no response.]

These three men have also been in the practice of medicine for fifty years.

I will ask, now, if Dr. Ellen A. Wallace of Manchester is here.

DR. ELLEN A. WALLACE: *Mr. President and Gentlemen of the Society*—Fifty-three years ago, when I decided to be a doctor, all my family and my friends opposed it, because my health was not good and they said that I would never live to be a doctor. Since I heard from Dr. Metcalf that my fifty years was over, I have wished some of those people could know that I had practiced medicine for fifty years.

[Dr. Clifton S. Abbott then assumed the Chairmanship of the Session.]

CHAIRMAN ABBOTT: Members of the New Hampshire Medical Society, you are now witnessing the high spot in the career of the Vice-President of your Society. So far as I know, this is the only official duty that the Vice-President has. But this, unfortunately for the Vice-President, has not escaped the eagle eye of our President or that of our Secretary, both of whom say, "No more will there be a year of delightful indolence for the Vice-President, for next year the Vice-President must have a job."

This being so, I will proceed with my job, and present to you the President of the New Hampshire Medical Society, Dr. Frederic P. Lord, who will deliver the President's Address.

The President's Address was followed by a symposium on Obstetrics with the following speakers:

Ante-Partum Care—Marion F. Eades, Boston, Mass.

Mechanics of Delivery (especially as it relates to intracranial hemorrhage)—Frederick C. Irving, Boston, Mass.

Post-Partum Infections—Foster S. Kellogg, Boston, Mass.

Care of the Newborn Infant—Richard S. Eustis, Boston, Mass.

Open discussion.

WEDNESDAY MORNING, MAY 8, 1935

The Session convened at ten-fifty o'clock in the morning, with President Lord presiding.

PRESIDENT LORD: The meeting will please come to order.

We have been entertaining angels for the last two days, mostly from New England, and, as their wings are not visible, I am going to ask them to stand as I call their names, and then, as each one wishes to say a word, I will be glad to hear from them. These men are none other than the visiting delegates.

Is Dr. Charles Kinghorn from Kittery, Maine, here?

Is Dr. Pillsbury of Lowell present, or Dr. Dutton of Wakefield?

[Dr. Dutton arose and the audience applauded.]

PRESIDENT LORD: Is Dr. Cutter of Providence here?

DR. CUTTER: *Mr. President and Members of the New Hampshire Medical Society*—My colleague here says that I am the senior member, and I am very glad to bring the greetings of the Rhode Island Medical Society to this meeting of the New Hampshire Medical Society.

It has been a very enjoyable meeting, and I have had a great deal of pleasure in listening to the program thus far. Our Society and our State organization are probably very similar to yours. We have the same problems to meet that you have, and we have the same threatening of industrial or state medicine that seems to be hanging over the rest of New England. I don't know when it is coming, but we have some indications of it at the present time.

Our treatment and care of the indigent patients, or the patients who are on relief, emergency relief, now have been delegated to the general profession in Providence. Instead of having city physicians or special physicians appointed to attend these patients, they are allowed to call any physician in the community and that physician, if he gets an authorization from the Public Aid Department, can render a bill for fifty per cent of the normal ordinary fee which is charged. If the case is properly on relief, that bill will be paid; otherwise, the physician is out of luck, as he frequently is.

The number of those cases, of course, and the number of cases that are entirely charity cases in our city, is very large indeed, so that our income as physicians has been greatly curtailed, while the amount of work that we are doing has been perhaps up to par or a little better, but a large part of it has been and has to be charity work. People are not allowed to suffer, and we are not always able to discriminate between patients who will pay and the patients who will be entirely charity cases.

All the members of the profession in Rhode Island, I think, have been fairly busy. Their incomes have all been cut. I know that the income tax that we are paying as physicians is about fifty per cent of what it was six or seven years ago, and I presume that is true all over New England. The earned income that we receive is very much curtailed. And some of us find that as we are getting older, our work is also decreasing. I know, for myself, that for the past year or two my work has consisted very largely in signing death certificates.

PRESIDENT LORD: Thank you, Dr. Cutter. We appreciate your remarks about Providence.

Is Dr. Philip Batchelder of Providence here this morning?

DR. PHILIP BATCHELDER: I join with Dr. Cutter in bringing the greetings of the Rhode Island Medical Society. I am enjoying the meeting very much, too.

PRESIDENT LORD: Our representative from Connecticut, who, I hope, is here, is Dr. Arthur B. Landry of Hartford, Connecticut.

DR. ARTHUR B. LANDRY: *Mr. President and members of the New Hampshire Medical Society*—It is indeed a great pleasure for me to be here to represent the membership of the Connecticut State Medical Society.

I want to tell you that the State of Connecticut is celebrating its Tercentenary this year, and while I have not been delegated to invite you to come to our State and help us celebrate this great anniversary, I am going to do so just the same. I hope that as many of you who can come to Connecticut will do so.

The Connecticut State Medical Society holds a clinical congress in New Haven each year, and this year we hold the Congress in September. If you gentlemen can escape the fascinating influences of your medical centers for a while and can think of coming down to New Haven to this Clinical Congress, I am sure that you will be well entertained.

I want to thank you very much for the handsome way in which you have received us, and I hope that we will, accordingly, receive your delegates when they come to see us this month.

PRESIDENT LORD: Is the delegate from Vermont here?

[There was no response.]

PRESIDENT LORD: Are there any other visiting delegates present?

A MEMBER: There is a gentleman here at my left, Mr. President, who informs me that he just arrived here by plane from Palo Alto, California, and tomorrow he is going to hop off again. He is Dr. Grooms of California.

DR. GROOMS: I suppose it is rather a novelty for a medical man to travel much by plane. Since 1914, up to the present time, I think I have traveled something like 150,000 hours a year.

Traveling by air has its advantages and some disadvantages. I found out, too late, that you have a field here; otherwise, I would have landed on your doorstep instead of grounding at Boston. However, I hope that I will come this way again, and I will make use of your local airport.

PRESIDENT LORD: We hope you will, and we hope that others will try the same.

Our first presentation this morning will be on the subject of Bronchoscopy, given by Dr. John A. Coyle of Hanover and Dr. Leslie K. Sycamore of Hanover.

The morning program continued with the following two papers:

"Treatment of Burns," Grover C. Penberthy, Detroit, Michigan. Discussion opened by Walter H. Lacey, Keene; James W. Jameson, Concord.

"Nutritive Failures as a Clinical Problem," James S. McLester, Birmingham, Alabama, President-Elect, American Medical Association.

WEDNESDAY AFTERNOON, MAY 8, 1935

The Session convened at three o'clock in the afternoon, with President Lord presiding.

PRESIDENT LORD: The meeting will please come to order.

The first matter on the program this afternoon is slightly different from the usual order of things. We are going to introduce our new President to the Society a little earlier than formerly.

In his régime as Vice-President, as he says himself, he had "nothing to do", but we have now fixed it up so that in the future the President will have nothing to do because the Vice-President will do it all. So it will work out that Dr. Abbott has had nothing to do as Vice-President, and he will also have nothing to do as President. He has been Secretary of his own county society, and we all know him very well and have known him for many years.

I take great pleasure in presenting our new President, Dr. Clifton S. Abbott.

PRESIDENT-ELECT ABBOTT: My friends, I thank you for this fine reception and I thank you for this distinguished honor that you have done me by electing me your President. I am beginning to realize that there are exacting duties, perplexing problems and considerable hard work associated with the office. All that I can say at this time is that I hope, with your help, I may carry on as acceptably as some of my eminent predecessors in the past.

PRESIDENT LORD: Gentlemen, I wish you to listen to a man who will speak to us in regard to a matter in which we are all interested. I will ask Lt. Col. John T. Aydelotte if he will come to the platform.

LT. COL. AYDELOTTE: *Mr. President and members of the New Hampshire Medical Society*—My message, happily, is brief. It is an important message, nevertheless.

It is my purpose to discuss one or two features of the present military medical preparedness of our country. For a period after the war, we had many thousands of medical men who knew much about the art of war in a medical sense. Those of you who were in the army know that you must be something more than a private practitioner in order, properly, to take care of such work.

I believe that it may be properly said to be a truth that it is a little late to begin to learn after war is being declared. For that reason, wise heads in our Federal Government believed, fought for, and finally brought to pass a law which would continue the knowledge gained in war. Among other methods, there was established what was known as an R. O. T. C. unit in the principal medical schools. Schools in every portion of America were represented with R. O. T. C. units, in which medical students were taught military science, as it pertains to medicine, with their medical career.

I know that those units were well received, and that the teaching was believed to be of value by the faculty. We, ourselves, in the regular Army Medical Corps, were proud of what we were doing.

The Congress, in recent years, has failed to appropriate money for the maintenance of these units. As a consequence, the last one of our classes graduated members and commissioned them in 1935.

How are we going to get replacements for the Reserve Corps of the Medical Department hereafter? Fifty per cent of our reservists commissioned in the Medical Department came from our medical units. But that is lost to us now, and I would say that we are somewhat concerned as to where our replacements are to come from hereafter. And it is not sufficient to say "replacements" only, for we not only require replacements, gentlemen, but actually, we require additions. The only thing that we can do is to come to the medical profession of the country. And so, we come out and tell our story to you.

What am I asking you to do about it, gentlemen? Only this. You must be preparedness-minded.

Whom do we want? We want all physically fit medical, dental and veterinary men, that is true; but we must have the young fellows, too. The older men have learned much, but after all, the older men are not going to be with us so long as the younger ones, and we would like to train the latter as soon after they leave the medical schools as possible.

The trained men will certainly get a better berth. They will get a better commission when war starts than the ones who will take potluck if they wait.

Please advise the young men of the medical profession, then, that it behooves them, as a part of their duties, to be prepared in case of war. I don't know how Mr. Young Medical Man may feel about it now, when war is perhaps so remote. But I do know this. I know that many thousands of doctors came into the army during the war, and how much better for every one of them who came in if they had had some training before the day arrived when they were to put on their uniforms.

PRESIDENT LORD: There is a sentence in our By-Laws to this effect, concerning the duties of the Committee on Public Relations, Public Policy and Legislation, now changed to the Committee on Public Relations; that it shall have the authority to be heard before the entire Society upon questions of great concern at such time as may be arranged during the annual session.

This committee feels that this is an occasion where we wish to have presented to you a matter of great concern, and I am going to ask the Chairman of the Committee on Medical Relief to speak to us to-day.

DR. ROBERT J. GRAVES: *Mr. President and Gentlemen*—The basis for the work of the Advisory Committee on Medical Relief are two fundamental premises, the first of which is that the patient shall have an opportunity, within reasonable limits, of selecting his own doctor, and the second of which is that the doctor shall receive a reasonable remuneration for his services.

Probably the shortest way of getting across what we have done to date, which is tentative but reasonably final, will be to read our report which we made to the House of Delegates.

[Dr. Graves then read the report referred to.]

PRESIDENT LORD: In arranging this program, the Committee was very anxious to have some discussion in regard to medical economics, in which we are all interested.

Perhaps the trouble is that too many of us would like to talk about it. So we have gone to the one who could tell us more authoritatively about it than any one I know.

It is a great pleasure for me to present to you at this time Dr. Nathan B. Van Etten of New York City, Vice-Speaker of the House of Delegates of the American Medical Association, who will address you on the subject of "Medical Economics of 1935."

The program continued as follows:

"Bright's Disease," Harold E. MacMahon, Boston, Mass. Discussion opened by A. Philip LaFrance, Laconia, Clarence O. Coburn, Manchester.

"Treatment of Skull Fractures," Harry E. Mock, Chicago, Illinois. Discussion opened by Emery M. Fitch, Claremont, Herbert L. Taylor, Portsmouth.

REPORT OF THE TRUSTEES OF THE NEW HAMPSHIRE MEDICAL SOCIETY

For the Year Ending May 1, 1935

RECEIPTS

December 26, 1934—Received from Carleton R. Metcalf, Treasurer. This was deposited in the Nashua Trust Company as a part of the General Fund	$500.00

EXPENDITURES

August 27, 1934—Paid D. G. Smith, Delegate to the A. M. A., his expenses for the Cleveland meeting, by check from the Portsmouth Trust and Guarantee Company	$81.02

SPECIAL FUNDS

The Bartlett Fund

Deposit in the Portsmouth Savings Bank—Book No. 21110. The original bequest ($352.11), by the terms of the will, is kept as a permanent fund	$5,645.22

The Pray Fund

Deposit in the Strafford Savings Bank—Book No. A 42. $1000.00 of this must be kept as a permanent fund, the income of which is to be expended for prize essays	1,357.95

The Burnham Fund

Deposit in the New Hampshire Savings Bank—Book No. 80106. $1,140.00 must be kept permanently; the income to be expended for prize essays. $100.04 was withdrawn for this use in 1934	1,964.12

The Benevolence Fund

Deposit in the New Hampshire Savings Bank—Book No. 99559	902.09

The General Fund

Deposit in the Portsmouth Trust & Guarantee Company—Book No. 12813	3,078.61
Deposit in the New Hampshire Savings Bank—Book No. 35696	4,938.44
Deposit in the Nashua Trust Company Savings Department—Book No. 4382	500.00
Total Funds on Deposit	$18,386.43

FUNDS NOT FOR GENERAL USE

The Bartlett Fund	$352.11	
The Pray Fund	1,357.95	
The Burnham Fund	1,964.12	
The Benevolence Fund	902.09	
		4,576.27
Present Funds Available for General Use		$13,810.16
Funds Available for General Use May 1, 1934		13,035.64
Net Gain for the Year		$774.52

The balance due the Society from the Merrimac River Savings Bank—Book No. 26934—in process of liquidation, is	$733.55

Your Trustees consider this of little value.

The Accounts of the Treasurer have been examined and found correctly cast and properly vouched.

HENRY O. SMITH,
THOMAS W. LUCE.

PRESIDENT LORD: If there is no further business to come before the meeting, I declare this One Hundred and Forty-Fourth Annual Session of the New Hampshire Medical Society adjourned.

MISCELLANY

EXCERPT FROM VITAL STATISTICS OF NEW HAMPSHIRE

During the year 1933 there were 7,419 births, 6,304 marriages and 6,498 deaths, while during 1934 there were 7,864 births, 7,261 marriages and 6,398 deaths. This makes an increase of 445 births and 957 marriages during the year 1934, while there was a decrease of 100 deaths.

During the year 1933 there were 615 divorces (legal separations and annulments included), while during 1934 there were 737. There were 545 minor children affected by the divorces for the year 1933, while for the year 1934 there were 696 children affected.—*Health.* Issued monthly by the New Hampshire Board of Health.

RECENT DEATHS

REMICK—Edwin Remick, M.D., of Tamworth, New Hampshire, died suddenly, June 2, 1935. He was born in Tamworth, New Hampshire, in 1866, the son of Levi and Harriet Beede Remick, and was educated in the public schools, Fryeburg and Northwood Academies and was graduated from the University of Vermont Medical School in 1894.

He was a member of Carroll County Medical Society, the New Hampshire Medical Society, and the American Medical Association.

Dr. Remick is succeeded by his son, Dr. Edwin C. Remick, of Tamworth.

MOUSLEY—Bayard Taylor Mousley, M.D., of Walpole, New Hampshire, died at his home, May 30, 1935. He was born in Oxford, New Hampshire, January 17, 1879, the son of the late William and Catherine Quint Mousley.

He graduated from the Kimball Union Academy at Meriden, studied two years at the University of Vermont and obtained his degree in medicine at the University of Maryland.

FELLOWS—George Robert Fellows, M.D., of Seabrook, New Hampshire, died late in June 1935, aged eighty-six years. He had practiced in Seabrook for forty-nine years and was in Florida where he went in an effort to regain his health.

The announcement from Florida was dated June 28, but without specific statement of the date of death. He is believed to have been the oldest practitioner of New Hampshire.

Dr. Fellows was a member of the New Hampshire Medical Society.

COMBINED EXTRA-UTERINE AND INTRA-UTERINE PREGNANCY*

A Report of Two Cases

BY ROY J. HEFFERNAN, M.D.†

CO-EXISTING extra-uterine and intra-uterine pregnancy is unusual but not extremely rare. Neugebauer[1] collected 243 cases from the literature up to 1913. Stein[2] added 36 cases more up to 1928, including one of his own. A fairly comprehensive search revealed no further cases. Thus the instances described below make the total number reported to date, 281.

Case 1. Mrs. J., aged twenty-five, family and past history unimportant, no previous pregnancies. The last regular period occurred June 12. On July 23, the patient began flowing and developed sharp pains in the right lower quadrant. Her family doctor performed a curettage at home on August 7. The flowing and pains continued intermittently, with dizziness and syncope. On August 22, I was asked to see the patient and found her resting comfortably in bed with a normal temperature, a pulse rate of 112 and a respiratory rate of 24. The complaints were low abdominal discomfort with pain on sitting or attempt at defecation. Physical examination revealed pallor of the skin and mucous membranes. A tender mass, more prominent on the right, extended to the level of the umbilicus. Vaginal examination showed a nulliparous introitus, with slight bloody discharge. The cervix was closed and cervical tug was very painful. The fundus seemed displaced to the left but could not be definitely outlined. The patient was transferred to St. Margaret's Hospital, Dorchester, with a diagnosis of ruptured extra-uterine pregnancy.

On August 23, under gas-ether anesthesia the abdomen was opened by a median suprapubic incision, exposing a hematocele which filled the right side of the pelvis. The clots and fluid blood were removed disclosing a rupture of the outer third of the right tube. The uterus was about twice normal size; the right ovary and left adnexa appeared normal. After a right salpingectomy, the abdomen was closed in layers without drainage.

Seventeen months later I delivered this patient, by low forceps, of a full-term normal female child.

Eight months later the patient informed me, by telephone, that she had missed two periods, had begun to flow one hour before and had severe pain in her lower left abdomen. She said: "I think my left tube is bursting now!"

Examination showed a moderate bloody flow, a uterus enlarged to the size of a ten weeks' pregnancy, with the fundus in good anterior position. There was general pelvic tenderness most marked in the left vault, which contained a lemon-sized tender mass. The patient was transferred to the Carney Hospital and prepared for immediate operation.

The abdomen was reopened in the median line disclosing considerable free blood and clots with a break of the middle third of the left tube, which contained a ruptured vessel, pumping blood. It was remarked that the uterus appeared larger than usual

*Read at a meeting of the Obstetrical Society of Boston, February 19, 1935.

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for a tubal pregnancy. A left salpingectomy was done, the blood clots were removed but the fluid blood was undisturbed. The incision was then closed without drainage. As an intra-uterine pregnancy was suspected the patient was kept under the influence of morphia for three days but on the fourth day after the operation the patient expelled a two months' fetus, with membranes intact. She made a good recovery and left the hospital on the thirteenth day.

CASE 2. Mrs. C., aged thirty-four, was seen in consultation with Dr. Francis Broderick of Jamaica Plain on March 24, at the Forest Hills Hospital. The past history and family history were irrelevant. There had been one miscarriage four years previously, and one full term normal delivery fourteen months ago. In January, there had been one scant period, the first since delivery, but the patient thought her amenorrhea was due to the fact that she was still nursing the baby.

On March 23, while tugging at the baby carriage she felt a sudden, severe pain in the right lower abdomen. Thinking she had strained a muscle the patient went to bed but the pain became more severe and she was sent to the hospital.

Examination showed extreme pallor, a pulse of 148 and the blood pressure 60 over 0. The abdomen was moderately distended with marked tenderness in the right lower quadrant. Vaginal examination revealed a parous introitus with no signs of inflammation and no bloody discharge. The cervix was closed and cervical tug very painful. The fundus was enlarged but definite palpation was impossible because of pelvic tenderness. An indefinite tender mass could be felt in the right vault.

Glucose and salt solution were given by vein and hypodermoclysis. A donor was secured and 750 cc. of blood were given by the citrate method. The pulse dropped to 112 and the patient's general condition was very much improved. Under local anesthesia, supplemented later with nitrous oxide and oxygen, the abdomen was opened by a median suprapubic incision. The peritoneal cavity contained a tremendous amount of fluid and clotted blood. The distal half of the right tube was ruptured. This was quickly removed and all easily accessible clots were extracted. The incision was closed without drainage and the patient returned to bed in fair condition, pulse 114, blood pressure 94 over 48.

Three days later, with very little flowing, the patient expelled a ten weeks' fetus, promptly followed by placenta and membranes. After an afebrile convalescence the patient left the hospital on the fifteenth day and soon regained her normal health.

SUMMARY

Two cases of combined extra-uterine and intra-uterine pregnancy are described, bringing the total number reported to date up to 281.

Clinically the condition should be borne in mind lest the passage of conception products per vaginam lull one into a false sense of security concerning extra-uterine pregnancy.

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CASE REPORT. BRONCHIAL ASTHMA DUE TO PAPER SENSITIVITY

BY THEODORE BENNETT, M.D.*

THE following case of asthmatic bronchitis is reported because of its unusual etiology and its subsequent cure, upon the discovery and removal of the irritating cause.

I. S., a white female, aged ten, was first seen by me in August, 1931 with a history of attacks of difficulty in breathing occurring at irregular periods for the past six years. The attacks would occur suddenly, were accompanied by expiratory dyspnea and considerable wheezing, and would last from a day to as long as one week. They were relieved temporarily by the administration of either adrenalin or ephedrine sulphate and in the more prolonged attacks by the use of morphine.

Skin tests performed by competent allergists for the routine foreign proteins were all negative.

Past history revealed the fact that shortly before the onset of the asthma, the patient had had pertussis followed by pneumonia. The family history disclosed a definite history of allergy, the mother having hay fever and a younger sister having occasional attacks of urticaria.

During the month of August the patient had three asthmatic attacks, and on discussing the case further with the mother the following information was obtained: namely, that in infancy the patient developed the habit, which has persisted up to the present time, of eating paper of all descriptions. As she became older the habit became so intrenched that in spite of the most severe and strict supervision, the family was unable to bring about its correction. A skin test for paper showed a marked reaction and instructions were given to the mother in an attempt to remove this irritating habit.

The patient was not seen again until April of 1934 when she was brought to me because of loss of weight, persistent cough, and night sweats. An interval history disclosed the fact that she had been sent away to a foster home as a problem child but in spite of strict supervision she still ate paper when excited, resulting in an attack of asthma shortly thereafter. Examination at this time disclosed a marked degree of malnutrition and secondary anemia. Height, 57¾ inches (2 inches shorter than average for age). Weight, 65 pounds, (17 pounds underweight). Tuberculosis was ruled out by a negative tuberculin 1:1000 and a negative x-ray of the lungs. With complete bed rest and high caloric diet the patient gained five pounds in two weeks but one week later, after eating paper, developed an attack of asthma.

Because of the direct relationship between the asthma and the eating of paper and because it was impossible to break this pernicious habit, she was referred for psychoanalysis in an attempt to find some cause for this peculiar mental aberration. After three months of this form of treatment (May to August) she stopped the habit and for five months has not had an attack of asthma.

The time is too short to state definitely that this patient is completely cured but the case is interesting from its etiological standpoint.

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CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 21291

PRESENTATION OF CASE

A fifty-eight year old Italian candy worker entered complaining of chest pain and afternoon fever.

Eleven months before admission he had sudden onset of sharp pain in the anterior portion of the left upper chest. The pain was constant and not aggravated by deep breathing or exertion. It lasted for about three days and then completely disappeared. There was some associated cough with slight blood streaked sputum on two or three occasions but no frank hemoptysis. He remained in bed during this three day period, having an afternoon temperature of 99° to 100°, and then returned to work. He felt perfectly well although he began to lose weight and during the next seven months lost twenty-eight pounds. He still had some cough, worse in the morning, which he attributed to cigarettes. Four months before admission he noticed fever at night but no real night sweats. At about this time he began having a low grade fever of 99° to 100° every afternoon with a normal temperature in the morning. Two months before admission he had another attack of chest pain similar to the first which lasted only one day and this time was associated with more purulent and blood streaked sputum. As before there was no malaise and no relation to exertion or deep breathing. Several sputum specimens were sent to a laboratory and were reported as negative for tubercle bacilli. X-rays at this time were said to show pleurisy. He was put to bed, however, and remained there during the past two months. He continued to have afternoon fever but felt strong and gained nine pounds during the past six weeks. Four weeks before admission he had a third attack of chest pain exactly similar to his previous attacks and again lasting three days. His sputum again was negative for tubercle bacilli and x-rays again were reported as having shown pleurisy in the left chest.

His family history is non-contributory.

He had been married thirty-two years. His wife and six children were living and well. One of his sons had had a tuberculous knee for four years without, however, any evidence of pulmonary involvement.

He had influenza eight years before entry followed by acute nephritis and nocturia for the following three months. He had frequent sore throats and had had typhoid fever at the age of 20.

Physical examination showed a well-developed and nourished middle-aged man in no apparent distress. His teeth were dirty and there was moderate pyorrhea. The chest was barrel shaped and expansion was better on the right. The right lung was normal. The upper half of the left lung anteriorly showed flatness, absent tactile fremitus, diminished spoken voice and bronchial breathing. Posteriorly at the left base there was flatness, absent tactile fremitus and diminished breath sounds. There were fine râles at the angle of the left scapula and coarse râles just below the right scapula. Because of the flatness in the lung fields the left border of the heart could not be made out. No murmurs were heard. The blood pressure was 110/66.

The temperature was 98.4°, the pulse 100. The respirations were 20.

Examination of the urine showed a specific gravity of 1.010 to 1.025 and a "green with" test for sugar. The sediment was negative. The blood showed a red cell count of 4,470,000, with a hemoglobin of 90 per cent. The white cell count was 24,650, 84 per cent polymorphonuclears. The stools were negative. Six sputum examinations were negative for tubercle bacilli. A few were blood tinged. A Hinton test was positive, a Wassermann negative. The phenolsulphonephthalein test gave 65 per cent excretion in two hours, 20 per cent during the first fifteen minutes.

X-ray examination of the chest showed hazy homogeneous dullness involving the greater portion of the left lung field. There was only a small amount of radiant lung above the costophrenic angle. A lateral view showed that the dullness lay entirely anterior to the septum between the upper and lower lobes and was sharply limited by the septum. The diaphragm on the left was high in position and somewhat limited in excursion. The heart shadow and trachea were displaced to the left and there was narrowing of the interspaces on this side. The right lung field was clear. There was a 2 centimeter irregular area of calcification at the left lung root.

He continued to have a slightly elevated temperature in the afternoon and evening. On the ninth day a bronchoscopic examination showed a generalized thickening of the mucosa of the left bronchus. The left upper lobe bronchus was very definitely narrowed but there was no outcropping. A small amount of purulent secretion was seen coming out of this upper lobe bronchus.

The carina between the upper lobe bronchus and the main bronchus was thickened. The following day he was put on potassium iodide solution, 15 drops three times a day. An x-ray film following pneumothorax on the thirteenth day showed fluid in the left costophrenic angle. There was a questionable 3 centimeter cavity with a fluid level in the region of the collapsed lung field. This cavity could not be seen very well on a lateral film. The findings were consistent with an abscess cavity in the collapsed left upper lobe. The bones in the chest showed no evidence of metastases. On the sixteenth day 100 cubic centimeters of turbid yellow fluid was removed from the left pleural cavity. The fluid showed a specific gravity of 1.030 and had a cell count of 10,000 per centimeter, 90 per cent lymphocytes and 10 per cent polymorphonuclears. A smear showed no tubercle bacilli. A guinea pig inoculated with this fluid died ten days after inoculation of a streptococcus infection.

Another film with the artificial pneumothorax showed that the fluid level previously described at the left base was still present and in addition there were several other ringlike shadows just above the fluid level at the left base. Reexamination two days later showed a shifting fluid level which in the anterior-posterior view was at the left of the fourth left anterior interspace upon deep inspiration. In the right lateral anterior-posterior view the fluid level occupied the pleural space of the diaphragm up to the axilla. He was discharged approximately three weeks after admission.

At home he managed fairly well for a month or so and then began suddenly to go downhill very rapidly. There were no particularly acute episodes and he died approximately three months after discharge from the hospital.

Differential Diagnosis

Dr. Edward D. Churchill: The clinical course was that of a fifteen months' illness in the case of a fifty-eight year old Italian, progressive except for one period when he gained six pounds in weight, and punctuated by hemoptysis, cough and pleuritic pain. I think we must take into consideration the fact that this man was perfectly well and then was affected by an illness of a total duration of fifteen months with a progressive downhill course terminating in death. There were many sputum examinations all of which are reported as negative for tubercle bacilli.

X-ray Interpretation

Dr. George W. Holmes: This patient has had a large number of x-ray films taken, some of which were taken at this hospital, some in another institution. This is the first film that we have a record of and it shows a very definite extensive lesion involving the right upper lobe. The film taken about two months later shows an extension of that process apparently beyond the upper lobe. The left lung is unusually clear and brilliant, probably some compensatory emphysema but certainly no evidence of disease in this lung. An interesting point is that in the first film the heart is visible to the right of the spine and in the later films is not. I think it is fair to assume with the other findings that there has been a decrease in volume of the lung during that period. These films also show a dense apparently calcified mass near the root of the right lung. It is present in most of the films taken.

This film is the first one taken after he arrived at the hospital and does not give us much additional information over the films that he already had. There is a little more penetration. It shows some of the structure of the involved area. Certainly at that time there was nothing we could interpret as cavity formation. There is moderate elevation of the diaphragm, displacement of the heart and trachea and some narrowing of the costal spaces due to a process which is apparently confined to the upper part of the right lung.

Here we have a lateral view of the chest taken. This line is due to the septum between the upper and middle lobes. The lower lobe is entirely free. The process is confined to the upper lobe.

This is the film taken after pneumothorax, showing the partially collapsed lung, a moderate amount of fluid in the chest and in that area of pneumothorax, dense adhesions—shadows which I interpret as adhesions—extending from the lung to the pleura.

This film was taken about a month after admission. You can see a definite fluid level here. You might question whether that was in the lung or pleura. This is an antero-posterior view with the patient lying on his side. It shows the fluid level.

Dr. Churchill: Will you commit yourself definitely as to the fluid level being in a cavity within the lung or in the pleura?

Dr. Holmes: Of course the point that Dr. Churchill just made is a very important one. My experience has been that cavities like this with fluid in them are very rare in the pleural space. Just on the chances I would put it in the lung. But in this film it looks as if the fluid level went beyond the edge of the lung. That is the edge of the collapsed lung. I think it could perfectly well be in the lung. It hardly seems likely, that with the pleural space involved it would be possible to have as much collapse as that or such a fluid shift as you get here. I think you can say he has a cavity in the lung.

Dr. Churchill: Is this mediastinal shadow the aorta?

DR. HOLMES: I think so. One represents the ascending portion, the other the descending. I would not expect to find anything particularly wrong with the heart or aorta. I do not believe there is anything more. I think this calcified gland would influence me somewhat in the interpretation of the findings. We do not get calcification in tumors as a rule. Then too, I think it is rare for calcification to occur in metastatic glands. Is it not, Dr. Mallory?

DR. TRACY B. MALLORY: Yes, I should say so.

DR. CHURCHILL: In reviewing this first film taken on admission, there are a few points of interest. A note was made on physical examination that the left border could not be determined because of flatness in the left chest anteriorly. When it is impossible to percuss the left border of the heart very definite evidence can be obtained about displacement of the mediastinum by palpation of the trachea. Judging from the x-ray film the trachea would have been definitely felt to the left and a clinical diagnosis then could have been made of a lesion in the lung with displacement of the mediastinum toward the affected side. The suspicion of the examiner would then be aroused that the flatness was not due to fluid but to collapsed lung.

The physical signs as given stated that there was bronchial breathing anteriorly in this portion of the collapsed lung. If that is a true observation we must postulate an open bronchus rather than a closed bronchus. On the other hand, with marked displacement of the trachea, it is quite easy in placing the stethoscope anteriorly to receive direct transmission of the tracheal breath sounds. The x-ray at this time, as Dr. Holmes said, shows diffuse opacity associated with displacement of the mediastinum toward the left. There is no evidence of mass or of parenchymatous lung disease.

As to the cavity that appeared after the pneumothorax, I am uneasy about its interpretation. In the presence of pleural effusion and in the presence of effusion plus air in the pleural cavity, I think Dr. Holmes is right in being conservative about definitely placing that shadow within the lung. We have had a good deal of experience in cases of empyema with shadows that look for all the world like cavitation in the lung with fluid levels, and yet the clinical courses of the patients seem to indicate that the disease is confined to the pleura. Although Dr. Holmes is inclined to lean toward cavitation in the lung, I should lean toward its being a recess of the pleura with a fluid level from the effusion. The calcification at the hilum raises the question of tuberculosis. And even after the many sputum examinations I do not think that tuberculosis can be definitely ruled out in this patient. Tuberculosis in one lung, however, will rarely produce a steadily downhill course and death within fifteen months in a man of this age, particularly with a negative sputum throughout and with the slight febrile and general disturbance that he has shown.

I can see no other diagnosis on the data available than a progressive malignant lesion primary in the left lung. The fact that this was not shown by bronchoscopy does not exclude that diagnosis because bronchoscopy is limited in its ability to confirm the diagnosis of carcinoma of the lung. If it is positive it is accurate, if it is negative it may mean very little. The physical signs at the left base at the time he came in were interesting because they were those of a high diaphragm and there is no record of fluoroscopic findings which state that the diaphragm was high and limited in excursion and it was not stated whether the motion was paradoxical. Carcinoma of the lung may produce paralysis of the diaphragm by direct invasion of the phrenic nerve. This is one possible interpretation of the high diaphragm. The other interpretation is that the atelectasis increased the negative intrathoracic pressure giving a high and relatively fixed diaphragm. In conclusion, although I am not entirely willing to rule out tuberculosis, I can make no other diagnosis than a progressive primary carcinoma of the left lung.

CLINICAL DISCUSSION

DR. DONALD S. KING: My reaction on this case illustrates well the danger of a new idea. I have been impressed with the frequency with which the bronchi are involved in pulmonary tuberculosis. We have seen a number of cases where the atelectasis was definitely due to stenosis of the bronchi from tuberculous infection. In this particular case I studied the early film before atelectasis had taken place and thought that the process looked more like pulmonary tuberculosis than cancer. This diagnosis was made partly because of the calcified glands which were definitely present and partly because of the mottling in the upper lobe. The atelectasis which developed later I thought was due to tuberculosis of the bronchi. I tried to sell the idea to Dr. Cass but I never really convinced him that the case was not one of cancer. He examined very carefully a large number of sputum specimens and could find no tubercle bacilli, and it was on the basis of these repeatedly negative sputums that he insisted the process could not be tuberculosis. I had a faint ray of hope when the autopsy was done because in the gross there did appear to be an area of active tuberculosis in the upper lobe as well as the obvious carcinoma, but I now understand that microscopic examination has ruled out tuberculosis and that the whole process was due to carcinoma.

Clinical Diagnoses

Pulmonary tuberculosis.
Artificial pneumothorax.
Pleural effusion.

Dr. Edward D. Churchill's Diagnosis

Primary carcinoma of the lung.

Anatomic Diagnoses

Carcinoma, epidermoid, bronchiogenic, left upper lobe.
Pulmonary abscesses, multiple.
Pleuritis, chronic fibrous.
Empyema, left.
Emphysema, right lung.

Pathologic Discussion

Dr. Mallory: At autopsy we found a large tumor mass surrounding the branch of the left bronchus leading to the upper lobe. The mass seemed to be largely outside the bronchus and it was not evident in gross whether or not the mucosa was involved. I am not at all surprised that the bronchoscopist was unable to make a positive diagnosis because it was not until we had sections that we felt sure that the mucosa was involved and that the tumor was primary there. The bronchi of the upper lobe distal to the point of obstruction were dilated and filled with pus and well out in the periphery of the lobe were numerous abscess cavities. Other abscess cavities were found in the lower lobe, some of them quite definitely within the lung, others lying between the lung and the pleural cavity so that it was rather difficult to know whether to classify them as empyema or as lung abscesses. My impression was that although practically all of them started as lung abscesses several of them had broken through into the pleural cavity. The pleura itself was enormously thickened at the time of autopsy. That thickening must have developed in the course of the disease, since he first came under observation, because at autopsy the pleura was everywhere from five millimeters to one centimeter in thickness and was as dense as cartilage. It would have been rather difficult to get any x-ray picture through it at all.

The pericardium showed a fairly fresh pericarditis just beginning to undergo organization. We were not able, as Dr. King told you, to find any positive evidence of tuberculosis though at first one of the cavities at the apex seemed suggestive. Histologically, however, none of them showed tuberculosis and all proved to be purulent abscesses. The lymph nodes at the hilus were markedly anthracotic and fibrous but we did not find a calcified one.

CASE 21292

Presentation of Case

A thirty-two year old Canadian upholsterer entered complaining of fever and cough.

Eighteen days before entry he developed coryza and began to sweat considerably at night. Six days later he began to have an unproductive cough and he visited his physician who gave him medicine. He then developed muscular soreness and marked chilly sensations while in bed. One week before entry he began to raise pink sputum which gradually became brown and increased in quantity. Three days before entry he complained of a "tight sensation" in the left lower and right upper chests but he had no real pleural pain with the cough or on breathing. There was no previous history of cough, sputum, hemoptysis, weight loss, night sweats or poor health.

He was married and had one child who was living and well. His wife was six months pregnant. There were no miscarriages.

Ten months before entry he had a slight attack of what was called "stomach ulcers", which responded to dietary treatment.

Physical examination showed a well-developed, emaciated, cyanotic man in marked respiratory distress, sweating profusely and coughing up small amounts of greenish, slightly pink flecked, tenacious sputum. There were herpes under the nose and on the lips. Several teeth were missing. There was slight pyorrhea. His throat and tonsils were slightly injected. There was slight postnasal discharge. Râles were heard throughout both lungs. At the left base posteriorly there were dullness to flatness, bronchial breathing, increased tactile fremitus and whispered and spoken voice. Similar signs were found over the area corresponding to the right middle lobe. A friction rub was also heard at the left base. One examiner found amphoric breath sounds and slight tympany high in the right axilla and over the spine of the scapula. The heart was negative. The blood pressure was 130/50.

The temperature was 104.1°, the pulse 120. The respirations were 45.

Examination of the urine was negative except for an orange test for sugar. (He had been given intravenous glucose.) The blood showed a red cell count of 4,200,000, with a hemoglobin of 60 per cent. The white cell count was 34,500, 97 per cent polymorphonuclears. The sputum was thick, mucopurulent and contained numerous pneumococci, not types I, II or III. No tubercle bacilli were found. A blood culture showed no growth. A throat culture was negative for hemolytic streptococcus. A Hinton test was negative.

X-ray examination of the chest showed complete dullness of the right lung field with the

exception of an area just above the diaphragm. There was also dullness in the middle part of the left lower lung field and mottled dullness in the left upper lung field. The heart was not displaced.

The morning after admission there was evidence of complete consolidation of the left lower and right middle lobes. He was put in an oxygen tent. On the fourth day he was given two liters of ten per cent glucose. The temperature ranged between 101° and 102° and the pulse between 120 and 135. The white blood cell count ranged between 30,000 and 60,000 with 95 per cent polymorphonuclears. An x-ray film on the ninth day showed that the dullness in the right upper lobe had become less dense while that in the region of the left lower and upper lobes was increased. On the eleventh day the sputum for the first time showed numerous acid fast bacilli. He went downhill fairly rapidly and died three weeks after admission, approximately five and a half weeks after the onset of his illness.

Differential Diagnosis

Dr. Donald S. King: The history of the present illness is that of an acute upper respiratory infection with pneumonia.

The physical examination is that of areas of consolidation in both lungs. So far we are not getting away from an acute respiratory infection.

The main thing in the laboratory notes is the high white cell count with the high percentage of polymorphonuclears.

"X-ray examination of the chest showed complete dullness of the right lung field with the exception of an area just above the diaphragm." That is an important finding in that it rules out empyema unless it is encapsulated.

X-ray Interpretation

Dr. George W. Holmes: I can state from the films in addition to what has already been said that the process is quite diffuse, involving both lungs, apparently most marked at the root and gradually spreading out into the periphery. There is very little normal lung visible. There may be some emphysema at the right apex. The heart shadow looks a little as though the auricles were dilated. The diaphragm is about normal in position. This appearance is consistent with a widespread bronchopneumonic process.

Dr. King: You would not call it tuberculosis?

Dr. Holmes: It could be a tuberculous bronchopneumonia. I do not think one can tell from x-rays alone what the etiologic factor is.

Dr. King: There are no definite cavities that you can see in these films?

Dr. Holmes: No.

Differential Diagnosis Continued

Dr. King: So that we are again thrown back on a pneumonic process, it seems to me.

"On the eleventh day the sputum for the first time showed numerous acid fast bacilli." We cannot, therefore, doubt the presence of tubercle bacilli. We might want to. I think we have to assume that he has pulmonary tuberculosis unless by some chance there could have been a rupture of a gland into a bronchus as a terminal event and thus scatter a few "acid-fast red herring" across the trail. But I think we have to assume that it was pulmonary tuberculosis. The question is, is there a non-tuberculous pneumonia besides that? I think it is worthwhile going back over the story to see if the diagnosis of tuberculosis covers the whole picture. I do not see anything against tuberculosis in the history, although the explosive onset and the brownish sputum are more characteristic of pneumococcus infection than of an acute tuberculous process. Physical examination shows areas of consolidation throughout both lungs and these could be extensive tuberculosis. The herpes is perhaps more typical of pneumococcus infection. The "amphoric breathing" I will throw out since this is a very confusing sign. Certainly the x-ray does not show a cavity which would give amphoric breathing.

The laboratory findings are very important. I do not believe a white cell count running from 30,000 to 60,000 with 95 per cent polymorphonuclears is consistent with tuberculosis alone. I have never seen such a count in an uncomplicated tuberculosis. We have followed the blood of patients at the Channing Home for three years, running counts at least every month. The highest we have ever had is 20,000 and the polymorphonuclears do not usually run above 70 to 80 per cent. The present blood picture could be due to tuberculosis but I think it is distinctly unlikely. So that I would suggest that there is evidence here of infection other than tuberculosis and that it was a pneumonic process with tuberculosis as a complication. It is unusual for a tuberculous process to clear up on one side of the chest as this process did and spread later to the other side.

I should like to take a minute to show films on another case. The first x-ray was taken simply as a routine. Five months later the second film was taken, again as routine. The patient did not have a symptom or physical sign but the x-ray now shows a very small lesion with possible cavity. Three days later the x-ray was repeated and showed no change but again in three days there was a temperature of 101.4° and the patient had chills, malaise, and râles under the left clavicle. Four days after this there was positive sputum and definite x-ray evidence of an acute tuberculous pneumonia in the left

upper lobe. I present this case to show that tuberculosis can have an explosive onset and spread rapidly.

In regard to the case under consideration for diagnosis I am going to make a diagnosis of non-tuberculous pneumonia. The question then arises as to what organism may be responsible for the infection. The evidence as presented is in favor of a pneumococcus infection because pneumococci were found in the sputum and streptococcus was not shown in the throat culture. Nevertheless, the clinical course is much more like that of cases which we have been calling streptococcus pneumonia. We had quite a series of these cases a year ago. It is true, however, that we never fully established the streptococcus as the etiologic factor. In two cases of empyema following these infections however, streptococcus was recovered from the pus in the chest. So that on the basis of the clinical picture I shall make a diagnosis of streptococcus pneumonia and pulmonary tuberculosis.

Dr. Tracy B. Mallory: Have you any comment, Dr. Lord?

Dr. Frederick T. Lord: The differential diagnosis between acute pneumonic phthisis and pneumococcus lobar pneumonia is of special interest because of the benefits to be derived from specific serum therapy in certain types of pneumococcus infection. Diffuse infiltration involving an entire lobe is rarely observed with tuberculosis. It is usually endogenous in origin and occurs in consequence of the aspiration of the contents of a tuberculous cavity.

Regarding the symptoms, it is clear from the literature, especially the series of cases reported by Fraenkel and Troje, that there are significant differences in the clinical aspects of the two diseases. Patients with acute tuberculous lobar pneumonia are likely to have had previous manifestations suggesting the presence of a tuberculous process and at times hemoptysis is an initial symptom. The symptoms of onset are likely to differ from those with typical pneumococcus lobar pneumonia. The chill may be replaced by chilliness. Pain may be absent. The sputum is usually purulent and greenish rather than rusty. Tubercle bacilli are likely to be present. The temperature is more irregular and does not subside at the expected time. So far as the problem here is concerned, the symptoms of onset are atypical for acute pneumococcus infection and consistent with a tuberculous process. The marked leucocytosis is suggestive of a complicating non-tuberculous infection.

The clearing of a part of the involved lung as shown by the x-ray is more rapid than one would expect with tuberculous pneumonia, but it should be appreciated that tuberculous lobar pneumonia is not necessarily caseous in the whole of the involved region. Surrounding areas of caseation there is what Laennec spoke of as gelatinous infiltration. Microscopic examination shows alveoli filled with epithelioid cells and at the periphery the alveoli contain albuminous fluid and exfoliated epithelium. The process is partly due to an allergic reaction in an already sensitized individual and it has long been known that it is capable of partial resolution.

Dr. Alfred Kranes: We saw the patient on the ward and we too were very much puzzled as to whether he had tuberculous pneumonia or pneumococcus pneumonia. We thought later on that the presence of tubercle bacilli in the sputum was purely incidental and that the chief difficulty was the pneumococcus infection; that perhaps the acute pneumococcus infection had caused a focus of tuberculosis which was not very active to flare up and spread.

Clinical Diagnoses

Pulmonary tuberculosis.
Lobar pneumonia.

Dr. Donald S. King's Diagnoses

Streptococcus pneumonia.
Pulmonary tuberculosis.

Anatomic Diagnoses

Pulmonary tuberculosis, acute.
Tuberculous pneumonia.
Pleuritis, chronic fibrous.
Endocarditis, acute terminal, mitral.
Gastric ulcer.

Pathologic Discussion

Dr. Mallory: The difficulty in the differential diagnosis in this case was not so clearly understood and appreciated by us at the time of autopsy as I wish it had been. We found a very extensive pneumonic process irregularly scattered throughout all five lobes. At the left apex there were two definite cavities obviously tuberculous in character. Throughout the rest of the lung there were scattered tubercles in very large numbers, the majority of them isolated, but in some areas they were so close as to be confluent. Particularly in the lower lobes the tubercles became less obvious and one had a definite pneumonic process which I think could fairly be said to be a characteristic gelatinous pneumonia.

Microscopically the picture to my mind is consistent with pure tuberculosis. We have not attempted to stain streptococci or pneumococci in the sections, as perhaps we should do in order to rule out the possibility of superimposed infection, but we could find nothing in the sections that is not consistent with pure tuberculosis so far as cellular reaction is concerned.

Dr. Holmes: Was the cavity at the left apex very large?

DR. MALLORY: No, only two centimeters in diameter, the second one less than one centimeter.

A PHYSICIAN: Was there a polymorphonuclear exudate in the alveoli?

DR. MALLORY: The exudate is rather characteristic in that in the center of each alveolus or each group of alveoli there is a polymorphonuclear reaction and then at the periphery a mononuclear reaction. In some places there is beginning caseation, while in other areas the process has not gone far enough yet for caseation, though always the central mass is a leucocytic one. It is identical in appearance with experimental tuberculosis produced by massive doses of organisms. It is not a reaction that one sees very often in human cases. At the periphery of the lesions there is much edema and epithelialization of the alveoli as Dr. Lord suggested.

DR. KRANES: It is rather interesting that the diagnosis of tuberculosis was first made by the houseofficer who admitted him because of an erroneous physical finding. The amphoric breathing which he found at the right apex made him think there was a large tuberculous cavity there, in addition to a pneumococcus lobar pneumonia. The rest of us could not confirm this finding so we dismissed the possibility of tuberculosis until the bacilli were found in the sputum. At autopsy there was nothing at the right apex, but there was a cavity at the left apex.

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F. E. R. A. FOR PHYSICIANS

ON page 130 is given an outline of a plan of the state F. E. R. A. authorities in coöperation with the Boston Department of Health, to furnish employment to indigent physicians. This plan will justify careful reading, not only by those who live in Boston, but by those residing elsewhere, inasmuch as it is the desire of the Federal government to coöperate with similar projects elsewhere if the need for them is shown.

As will be seen by studying Mr. Hobbs' letter these projects are designed purely for the relief of the actually destitute. It is very unlikely that anybody, no matter how poor he may think he is, or however deeply in debt, would be considered for employment if he or any member of his immediate family has a net income of $10.00 to $20.00 a week. The exact limit will depend on the number of his dependents. Before being acted on favorably all applicants will have to show at an interview with the Social Service Department of the F. E. R. A. that they are eligible.

Some confusion may be encountered at first in relation to the place of residence of the applicant. It is understood that the applicant must reside at the time of application in the City or Town in which the project is being carried on. This is mentioned because this rule differs from the rules in regard to soldiers' aid or ordinary public relief where the "settlement" is the determining factor in deciding which government unit is responsible to a given applicant.

Inasmuch as the *Journal* is read by only a part of the physicians in Boston, those in charge of this project would appreciate it if the names of those who might be eligible were called to their attention. Whether we approve or do not approve the general proposition of Federal relief, if there are instances of such poverty among physicians in Boston it is only fair to them to have this project called to their attention.

MORE SUPPORT FOR BIRTH CONTROL

IN their meeting in Detroit on June 11, the General Federation of Women's Clubs, by a vote of 493 to 17, recorded its approval of the dissemination of birth control information through scientifically regulated sources. This action was not taken hastily but was the outcome of a year of study by member clubs. The resolution asserted "it is of utmost importance to all Americans that the population of our country be vigorous and healthy both mentally and physically, and that proper and intelligent use of scientific contraceptive methods under direction of qualified and reputable physicians is essential to these ends".

This action supports the bills now before Congress which would exempt physicians, hospitals and public clinics from the restrictions of the present Federal laws. Two of these bills, H. R. 5600 and S. 600, were introduced at the request of Mrs. Sanger, and a third bill, introduced by Senator Copeland and endorsed by the National Medical Committee on Birth Control Legislation, is intended to prevent the irresponsible distribution of contraceptive devices while at the same time it exempts physicians, hospitals and medical schools from the restrictions now in force.

The general opinion among those interested in the birth control movement is that the dissemination of contraceptive knowledge should be in the hands of the medical profession. In Europe the recognition of birth control as a public health measure is widespread; it is prohibited in those countries—Germany, Italy and France—which are engaged in competition for military supremacy. The Ministry of Health in Great Britain has officially recognized birth control as a public health measure. That public senti-

ment in this country is tending more and more to favor a properly regulated dissemination of contraceptive knowledge is clearly indicated by its endorsement by many churches, religious societies, welfare groups and professional organizations, and by the recent action of the New York Medical Society and the House of Delegates of the American Medical Association.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

GALLIE, W. E. M.D. University of Toronto Faculty of Medicine 1903. F.A.C.S., F.R.C.S. (England). Professor of Surgery, University of Toronto. Surgeon-in-Chief, Toronto General Hospital. His subject is "Dislocations." Page 91. Address: Medical Arts Building, Toronto, Canada.

MILLER, D. K. A.B., M.D. Harvard University Medical School 1929. Assistant Resident Physician, Hospital of the Rockefeller Institute for Medical Research. Address: Hospital of the Rockefeller Institute, 66th Street at York Avenue, New York, N. Y. Associated with him is

RHOADS, C. P. A.B., M.D. Harvard University Medical School 1924. Associate Member, Rockefeller Institute for Medical Research. Address: Hospital of the Rockefeller Institute, 66th Street at York Avenue, New York, N. Y. Their subject is "The Reticulocyte Response in Guinea Pigs Following the Oral Administration of Certain Anti-Anemic Substances." Page 99.

LLOYD, MILTON S. M.D., C.M., McGill University Faculty of Medicine, Montreal, 1924. Bronchoscopist, Flower Hospital. Assistant Thoracic Surgeon, Sea View Hospital, New York City. His subject is "The Early Classification and Early Diagnosis of Cancer of the Bronchus." Page 101. Address: 30 Central Park South, New York, N. Y.

HEFFERNAN, ROY J. M.D. Tufts College Medical School 1917. F.A.C.S. Visiting Gynecologist and Obstetrician, Carney Hospital. Visiting Obstetrician, St. Mary's Hospital. Instructor of Gynecology, Tufts College Medical School. His subject is "Combined Extra-Uterine and Intra-Uterine Pregnancy." Page 120. Address: 524 Commonwealth Avenue, Boston.

BENNETT, THEODORE. M.D. Tufts College Medical School 1928. Assistant Physician, Pediatric Department, Boston Dispensary. Assistant Instructor, Pediatric Department, Tufts College Medical School. His subject is "Case Report. Bronchial Asthma Due to Paper Sensitivity." Page 121. Address: 371 Commonwealth Avenue, Boston.

MASSACHUSETTS LEGISLATIVE NOTE

House 2245 which relates to "an investigation and study by the Commissioner of Public Health of the laws relative to public health and to the establishment and administration of a system of health insurance," which was referred to the next annual session of the House, July 9, 1935, was refused reconsideration July 11, 1935.

MISCELLANY

F.E.R.A. FOR PHYSICIANS IN BOSTON

A project for the employment of physicians in the City of Boston by the E.R.A. is in the process of formation. On July 7, 1935, the following letter was sent to the Boston members of the Suffolk District Society:

"To Boston Members of the Suffolk District Medical Society:

"The Society has been advised by representatives of the Federal Government that medical employment will be found whenever possible for those physicians who are residents of Boston and who are in urgent need of financial relief. The type of employment will be limited in the main to preventive medicine and in no way offers reimbursement for private practice.

"If you know of any physician who falls in the above class, kindly send in the name and address at once to the secretary.

"Very sincerely yours,

"ROBERT L. DENORMANDIE, *President.*"

Since then similar letters have been sent to Boston members of Middlesex South and Norfolk Societies. It is the purpose of the project to employ all doctors, not necessarily members of the Societies, who meet the following qualifications. They must be legal practitioners in medicine. They must be residents of Boston. They must be in such financial need that they are eligible for E.R.A. aid, and they must be employable.

The present project will be under the direction of Dr. Wilinsky of the Boston City Department of Health and will consist of work in the various health units. He will have nothing to do with the choosing of the men to work. Applications should not be made to him. Applicants will be examined by the Social Service Department of the E.R.A., at the Boston Medical Library, by appointment. Applications should be made first to the secretary of the proper District Society. Dr. A. A. Levi, 485 Commonwealth Avenue, for residents of Allston, Brighton and Charlestown. Dr. Frank S. Cruickshank, 1236 Beacon Street, Brookline, for residents of Roxbury, Dorchester, Hyde Park, Roslindale and West Roxbury, and Dr. Charles C. Lund, 319 Longwood Avenue, Boston, for the rest of Boston.

The following letter from Mr. Hobbs explains the general background of this type of project and may

be of interest to those who are thinking of initiating such projects elsewhere in Massachusetts:

"The first thing that we wish to impress upon you in regard to the Emergency Relief Administration is the fact that all projects should be built up around the needs of the community. Fine as a project may be in itself the E.R.A. is not officially interested unless it provides suitable work to a needy person.

"If there is a group of doctors in the community who are in as great need as any others then we wish to develop projects for them.

"Once the need has been established then the problem is to employ this group in the most profitable way possible. The project must be of economic and social value and must be for the benefit of the community at large. The E.R.A. cannot perform services for private institutions or for individuals.

"Many months ago we determined that doctors and dentists should be paid $20.00 a week for thirteen hours' service. A few simple rules were prepared for dentists, copy of which we enclose, and which would apply with equal force to doctors.

"We wish to warn you that the rules which we have stated above will be modified when the E.R.A. is transferred into the W.P.A. and this will probably come within a few weeks. Under the W.P.A. technical and professional employees will be paid $94.00 a month in Suffolk and Middlesex Counties, $83.00 a month in Norfolk. Other counties I do not believe you are interested in at the present time.

"Projects in Suffolk County will be under the direction of Col. Thomas F. Sullivan, 1 Beacon Street, Boston, and projects in Middlesex and Norfolk Counties will be under the direction of Mr. Byrle Osborne, 49 Federal Street, Boston.

"This is a very brief outline of the situation and if there is any further information which you would like please let me hear from you.

"Sincerely yours,

"CONRAD HOBBS,

"By direction of Howard P. Philbrook, Director of Work Division, Federal Emergency Relief Administration, of Massachusetts."

49 Federal Street,
Boston, Mass.

THE APPOINTMENT OF DR. FREDERICK F. RUSSELL

Dr. Frederick F. Russell of the Rockefeller Foundation will retire September 1, 1935 to fill an appointment as Lecturer on Preventive Medicine and Hygiene and Epidemiology at the Harvard Medical School.

He was graduated from the College of Physicians and Surgeons, Columbia University, with the additional title of Sc.D. from George Washington University.

On December 12, 1898 he became Commd. 1st lt. asst. surgeon, U. S. A.; Colonel in 1917, and resigned in 1920. Since 1921 he has held several positions in Washington, and was in charge of the Division of Infectious Diseases and of the Laboratory Service of the Surgeon General's Office, U. S. A., during the World War.

Dr. Russell is a Fellow of the American College of Surgeons, American Public Health Association, the New York Academy of Medicine, and a member of the American Medical Association and the Royal Medical Society of Budapest, Hungary.

RECENT DEATHS

DOWLING—JOHN JOSEPH DOWLING, M.D., Superintendent of the Boston City Hospital, died at his home on the hospital grounds, July 10, 1935, of cerebral thrombosis following an attack of pneumonia superimposed on a long illness.

Dr. Dowling had recently been granted a leave of absence with the hope of recuperating from an extended period of impaired health.

He was appointed Superintendent of the Hospital by Governor Curley when His Excellency was Mayor of Boston. Dr. Dowling is credited with the enlargement and modernization of the hospital while serving under a succession of Governors since his first appointment.

Dr. Dowling was born in Boston in 1870 and attended the public schools and the Boston Latin School. He graduated from the Harvard Medical School in 1894 and pursued postgraduate studies in Dublin and London. On returning to Boston he developed a large practice in Roxbury, Dorchester and the South End, relinquishing this to become the superintendent of the largest municipal hospital in the country.

He served in the World War as head of the Boston City Hospital Base Hospital No. 7 unit and returned to Boston with the rank of Lieutenant-Colonel.

Dr. Dowling was a Fellow of the Massachusetts Medical Society and the American Medical Association, the Harvard, the Clover and the Boston City Clubs.

He is survived by his widow, Mrs. Marcia Pugh Dowling; a daughter, Miss Barbara Dowling; a son, Mark Dowling, and two brothers, Mark Dowling and Frank Dowling, both of Boston.

MURPHY—JOHN JOSEPH MURPHY, M.D., of 2192 Massachusetts Avenue, North Cambridge, died suddenly July 8 at North Conway, New Hampshire, while on a vacation with Mrs. Murphy.

Dr. Murphy was born in 1886 and his early education was acquired in the Cambridge High and Latin Schools and Holy Cross College. He received his M.D. degree from the Harvard Medical School in 1913, and served an internship at the Boston City Hospital and the Boston Dispensary.

He enlisted in the army in 1916, was a lieutenant in the medical corps, was advanced to rank of captain in 1917, and served at Camp Benjamin Harri-

son and Camp Devens, later being promoted to the rank of major and assigned to the 302nd infantry. After the war he returned to Cambridge and developed an active practice.

Dr. Murphy was a member of the Surgical Staff of the Cambridge City Hospital, a Fellow of the Massachusetts Medical Society, the American Medical Association and the American College of Surgeons.

His widow, Mrs. Grace Donnelly Murphy, formerly of Somerville, survives him.

CALDWELL—JOHN OATLEY CALDWELL, M.D., of 40 Pond Street, Sharon, died at his home, January 19, 1935. He was born in Chicago in 1885, the son of John Caldwell and Jean Delue Caldwell. He graduated from tthe Middlesex College of Medicine and Surgery in 1921 and joined the Massachusetts Medical Society in 1928.

Dr. Caldwell is survived by his widow, Mrs. Margaret McNabb Caldwell, a son and a daughter.

NOTICES

REMOVAL

DR. JOHN A. MABONEY announces the removal of his office to 19 Chandler Street, Worcester, Mass. Tel. 2-7895.

UNITED STATES CIVIL SERVICE EXAMINATIONS

Medical Officer, $3,800 a Year
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Assistant Medical Officer, $2,600 a Year

Optional Branches—To become eligible, applicants must qualify in at least one of the following optional branches, *and must state in their applications the branch or branches desired:*

1. Cardiology, 2. Cancer diagnosis and treatment, 3. Eye, ear, nose, and throat, 4. Genitourinary (urology), 5. Internal medicine and diagnosis, 6. Neuropsychiatry, 7. Pathology and bacteriology, 8. Roentgenology, 9. Surgery (general or orthopedic), 10. Tuberculosis, 11. Venereal disease (Clinical or Public Health), 12. General practice (Associate Grade Only).

Applications must be on file with the United States Civil Service Commission at Washington, D. C., not later than July 29, 1935.

REPORTS AND NOTICE OF MEETINGS

ANNUAL MEETING, NATIONAL TUBERCULOSIS ASSOCIATION, SARANAC LAKE, JUNE 24-27, 1935

With the largest registration in its history—1,456—the thirty-first Annual Meeting of the National Tuberculosis Association was held at Saranac Lake, New York, June 24-27 inclusive. The attendance at this year's meeting was approximately double that of the annual meeting at Cincinnati in 1934. The meeting was held at Saranac Lake to do honor to the memory of Dr. Edward L. Trudeau fifty years after the establishment of his sanatorium in the Adirondacks.

The opening meeting on Monday evening, June 24, included in addition to the annual address of the President, the report of the Managing Director, the award of the Trudeau Medal, and the report of Dr. John B. Hawes, 2nd, of Boston, Chairman of the Committee on Nominations, an address by Dr. Allen K. Krause of Tucson, Arizona, on "Trudeau, the Man", an address by Dr. Charles C. Trembly of Saranac Lake, on "Trudeau, the Sportsman", and an address by Dr. H. A. Pattison of the Potts Memorial Hospital, Livingston, New York, on "Trudeau, the Churchman."

In the two days following the opening meeting, morning and afternoon sessions were held of the clinics, pathological, sociological, and administrative sections.

The effect on the family tuberculosis problem through lessened health and welfare budgets was described in a paper given in the Sociological Section by Dr. Henry D. Chadwick, Massachusetts State Commissioner of Public Health. Miss Mary Spaulding, Consultant in Nutrition in the State Department of Health, collaborated with Dr. Chadwick in the preparation of this paper.

On the closing day there was a symposium on "Present Concepts of Tuberculous Infection and Disease, their Principles and Application." Dr. Eugene L. Opie, Professor of Pathology of Cornell University Medical School, New York City, made the opening statement. The discussion was continued by Dr. J. A. Myers of the University of Minnesota; Dr. H. C. Sweany of the Chicago Municipal Tuberculosis Sanatorium; Dr. E. M. Medlar, Metropolitan Life Insurance Company Sanatorium; Dr. Esmond R. Long, Henry Phipps Institute, and Dr. Wade Hampton Frost, Johns Hopkins University.

The closing afternoon of the convention was devoted to a symposium on "How our Present Knowledge of Tuberculosis may be Applied in Community Programs." Dr. Alton S. Pope, Director of the Division of Tuberculosis of the Massachusetts Department of Health, discussed this subject from the standpoint of case-finding. Dr. John B. Hawes, 2nd of Boston, discussed the same subject with special reference to Preventoria and Summer Health Camps for children. Dr. Clarence L. Hyde, Superintendent of the Edwin Shaw Sanatorium, East Akron, Ohio, discussed the subject from the standpoint of institutional care and treatment. Dr. H. E. Kleinschmidt of the National Tuberculosis Association discussed it "Through Interpretation to the Public." The proceedings were brought to a close by a summary of the two symposia of the day by Dr. Iago Galdston, Director of Information Service of the New York Academy of Medicine.

Great enthusiasm greeted the announcement of the

award of the Trudeau Medal to Dr. Leroy U. Gardner, Director of the Saranac Laboratory.

On June 25 the "Little Red," the first sanatorium building erected by Dr. Trudeau in 1884, was re-dedicated with appropriate ceremonies. Dr. Kennon Dunham, of Cincinnati, President of the National Tuberculosis Association, presented a bronze plaque appropriately engraved signifying the re-dedication of the first sanatorium building. Dr. James Alexander Miller, President of the Trudeau Sanatorium Trustees, formally received the plaque and re-stated the purposes of the trustees to carry out the letter and spirit of the objectives of the sanatorium as announced by Dr. Trudeau at the time of its founding. Mrs. C. P. Lindsay of Albany, New York, who with her sister were the first patients cared for at the institution in 1885, was present at the rededication and took part in the exercises.

Seventy-eight persons from Massachusetts were registered at the Annual Meeting. Among these were the following: Dr. Frederick T. Lord, Mrs. Frederick T. Lord, Dr. Henry D. Chadwick, Dr. Gerardo M. Balboni, Dr. Sumner H. Remick, Dr. Francis P. Denny, Dr. John B. Hawes, 2nd, Dr. Carl C. MacCorison, Dr. Leon Alley, Miss Muriel Eales, Dr. Ernest B. Emerson, Dr. Parker M. Cort, Mr. Clifton Hobson, Mrs. Mabel Greeley Smith, Mr. Arthur J. Strawson, Mrs. Gertrude E. Brown, Miss Elsie F. Smith, Dr. Charles E. Gill, Mrs. A. L. Johnson, Dr. H. B. Chase, Miss Alice Kemp, Dr. Olin S. Pettingill, Miss Vera B. Griffin, Dr. Armand LaRoche, Miss Natalie U. Upton, Miss Bernice W. Billings, Miss Alma Massie, Dr. Julius Kelley, and Mr. Frank Kiernan.

ACADEMY OF PHYSICAL MEDICINE

Annual Meeting

The thirteenth Annual Meeting of the Academy of Physical Medicine was held at Atlantic City on June 12 and 13.

The program was replete with reports of the steady advances in Physical Medicine both in research and clinical application.

Dr. William Bierman of New York reported on the present status of electrical induction of therapeutic fever which has demonstrated its value in combating certain of the infections, particularly of the chronic types of organic nerve diseases of specific origin.

Papers on the use of short wave high frequency currents were presented by Dr. William H. Schmidt and Dr. Frank H. Krusen of Philadelphia and Dr. William D. McFee of Boston. It was the consensus that this development will add to what has already been accomplished in the use of diathermy as produced by apparatus of comparatively long waves.

There were many interesting reports of studies in the constantly changing field of radiology presented by Dr. J. Gershon-Cohen, Dr. Joseph Scattergood, Jr., Dr. Jacob Vastine of Philadelphia, Dr. Thomas L. Smyth of Allentown, Pa., Dr. Gustav Bucky of New York, Dr. Grant E. Ward of Baltimore and Dr. Frederick W. O'Brien of Boston.

Electrosurgery, particularly as applied to dermatology, was thoroughly discussed and its many advantages demonstrated in the treatment of neoplastic lesions wherein tissue may be destroyed with the least unfavorable result and with greatly improved cosmetic effects. Dr. William L. Clark, Dr. Melvin Franklin of Philadelphia, Dr. Anthony D. Cipollaro of New York, Dr. Austin W. Cheever and Dr. Francis M. Thurmon of Boston participated in these discussions.

The therapeutics of short wave ultraviolet radiation was given consideration, the subject being presented by Dr. Francis P. McCarthy and Dr. Francis M. Thurmon of Boston and Dr. Franklin P. Lowry of Newton. It was agreed that its chief value as a therapeutic agent is in some dermatological conditions.

Reports on the newest development in colonic therapy were presented by Dr. Harold K. Marshall of Gardner, Mass., Dr. James W. Wiltsie of Binghampton, N. Y., and Dr. Rolland A. Case of Cleveland, Ohio.

Body mechanics as related to the treatment of chronic arthritis was the subject of Dr. John G. Kuhns of Boston and Dr. George E. Deering of Worcester.

A newly devised physical treatment of peripheral vascular disease was described by Dr. Frank Hammond Krusen of Philadelphia.

Application of physical means in the treatment of digestive disturbances was well demonstrated by Dr. William A. Swalm and Dr. Charles-Francis Long of Philadelphia, Dr. Sara M. Jordan of Boston and Dr. Daniel N. Silverman of New Orleans.

At the Annual Round Table Dinner the honorary degree of F.A.P.M. was conferred by the President upon Dr. William D. McFee of Boston and Dr. Byron S. Price of New York in recognition of distinguished contribution to the development of Physical Medicine. Both, with the late Dr. Frank B. Granger of Boston, were co-founders of the Academy.

The following officers were elected:

President: Frank H. Krusen, M.D., Philadelphia, Pa., Vice-President: Groesbeck F. Walsh, M.D., Fairfield, Ala., Vice-President: Robert E. Peck, M.D., New Haven, Conn., *Secretary-Treasurer: Arthur H. Ring, M.D., Arlington, Mass., Assistant Secretary-Treasurer: Franklin P. Lowry, M.D., Newton, Mass.

Directors: For three years: William L. Clark, M.D., Philadelphia, Thomas L. Smyth, M.D., Allentown, Pa., For two years: Byron S. Price, M.D., New York, N. Y., Robert C. Hughes, M.D., Paoli, Pa., For one year: William D. McFee, M.D., Boston, Harold D. Corbusier, M.D., Plainfield, N. J.

Elected to fellowship at this meeting:

Gustav Bucky, M.D., New York, N. Y., Rolland A. Case, M.D., Cleveland, Ohio, Austin W. Cheever, M.D., Boston, Mass., Anthony D. Cipollaro, M.D., New York, N. Y., William G. Curtis, M.D., Wollaston, Mass., Jacob Gershon-Cohen, M.D., Philadelphia, William H. Guillium, M.D., Asbury Park, N. J., Otto

J. Hermann, M.D., Boston, Mass., John Severy Hibben, M.D., Pasadena, California, Harold K. Marshall, M.D., Gardner, Mass., Herman A. Osgood, M.D., Boston, Mass., Richard T. Powers, M.D., Springfield, Mass., Mary L. H. Arnold Snow, M.D., New York, N. Y., William A. Swalm, M.D., Philadelphia, Francis M. Thurmon, M.D., Boston, Mass., James W. Wiltsie, M.D., Binghampton, N. Y., Rebekah Wright, M.D., Boston, Mass.

To honorary fellowships:

Henri Dausset, M.D., Paris, France, A. d'Arsonval, Paris, France, Toreau de Counnelles, M.D., Paris, France, Melvin M. Franklin, M.D., Philadelphia.

*Dr. Arthur H. Ring, Secretary-Treasurer, died on June 25, 1935.

THE FOURTEENTH ANNUAL SESSION OF THE AMERICAN CONGRESS OF PHYSICAL THERAPY

The American Congress of Physical Therapy announces two important events:

1. An instruction class covering the field of physical therapy for September 5, 6, 7, 1935.

2. The fourteenth annual scientific and clinical session for September 9, 10, 11 and 12, 1935.

Both of these events will be held at the Hotel Kansas Citian, Kansas City, Missouri, and every detail has been arranged to give the busy practitioner and technician a full week of intensive study in physical therapy.

Dr. Franz Nagelschmidt, formerly of Berlin and now of London, England, will participate in the course and in the convention program. There will be symposia on many subjects, including arthritis, fever therapy, and short wave; clinical group conferences in the various specialties, and a joint meeting on Tuesday evening, September 10, with the Jackson County Medical Society. A more representative group of teachers and clinicians has seldom been brought together for a medical gathering. The scientific exhibits should prove of unusual interest.

Preliminary program and circular of information may be secured by addressing: American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, JULY 22, 1935

Wednesday, July 24—
†12 M. Clinico-Pathological Conference. Children's Hospital.

Thursday, July 25—
*12 M. Clinico-Pathological Conference. Massachusetts General Hospital.

Saturday, July 27—
*10-12. Staff rounds at the Peter Bent Brigham Hospital.

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

August 29 - September 5—Latin American Congress of Physical Therapy, X-Ray and Radium. For information address Dr. Madge C. L. McGuiness, 1211 Madison Avenue, New York City.

September 5, 6, 7—American Congress of Physical Therapy. See notice above.

October 7-10—American Public Health Association will meet in Milwaukee, Wisconsin. For information address the American Public Health Association, 50 West 50th Street, New York City.

October 21 - November 2—1935 Graduate Fortnight of the New York Academy of Medicine. See page 898, issue of May 9.

October 28 - November 1—The Twenty-Fifth Clinical Congress of the American College of Surgeons. See page 1065, issue of May 30.

BOOK REVIEW

The Management of Fractures, Dislocations, and Sprains. John Albert Key and H. Earle Conwell. 1165 Illustrations. 1164 pp. St. Louis: The C. V. Mosby Company. $15.00.

This book of more than one thousand pages is intended to be a practical working guide to the satisfactory care of fractures, dislocations and sprains. The form is excellent and the illustrations are most satisfactory.

When two surgeons combine their efforts in producing a book on the treatment of so important a subject as fractures, it is natural to look for considerable light on a difficult subject. When one of these surgeons has had a long and wide general experience with the handling of fractures in an industrial plant as well as in non-industrial cases and when the other surgeon is looked to for the results of careful work in the pathology of surgical diseases it is to be expected that such combined expressions of experiences will be valuable. We are not disappointed. After reading the book the reviewer is impressed with the sane, safe and effective conclusions as to treatment.

Many surgeons and most general practitioners are unprepared to treat fractures; they do so because they do not wish to lose a possible source of income. This phase of the situation is mentioned because this book by Key and Conwell brings vividly to mind the great extent, the tremendous importance and the unappreciated complexity of the fracture problem. Within its covers will be found the answers to several questions. When is a fracture really simple? How is a simple fracture to be treated? How may I know that I am ignorant of the way to care for a fracture? What shall I do for a fracture of this kind? How may I choose a consultant? How safely and comfortably may I transport the fracture to a surgeon trained in treating fractures?

The reviewer is impressed by the scope of this book, as well as by the splendid results of nonoperative methods of care under conditions which often lead too easily to operative treatment. The authors have included chapters on Workmen's Compensation Laws and Medico-Legal Aspects of Fracture Cases. The Chapter on Fracture of the Skull was written by the late Dr. Charles E. Dowman and that on Fractures of the Jaws and Bones of the Face by Dr. James B. Brown. Read Chapter XXV on Fractures of the Leg. It will illustrate for you sound treatment. This chapter is characteristic of the book.